INSTRUMENT
CAL LAB

INSTRUCTION MANUAL

REGULATED POWER SUPPLIES

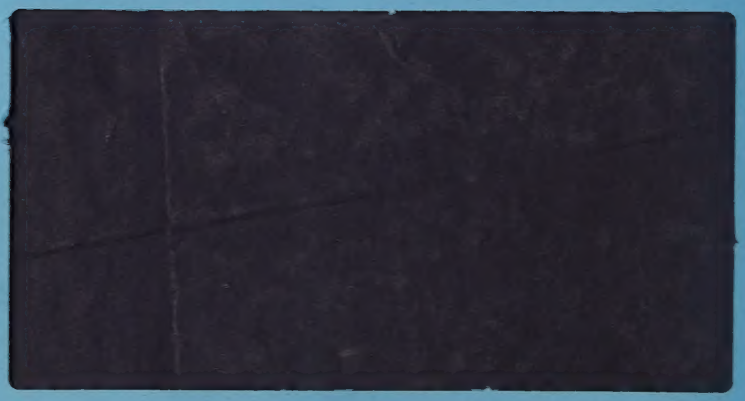
MODEL LM
EE PACKAGE

THIS MANUAL APPLIES TO UNITS
BEARING SERIAL NO. PREFIXES A & B

MP MASTER
MA28768

LAMBDA

LAMBDA ELECTRONICS CORP.–MELVILLE, L. I., N. Y.



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This manual provides instructions intended for the operation of Lambda power supplies, and is not to be reproduced without the written consent of Lambda Electronics Corp.

LAMBDA ELECTRONICS CORP. MELVILLE, L.I., N.Y.

MAIN PLANT TELEPHONE: 516 MYrtle 4-4200

TABLE OF CONTENTS

SECTION	PAGE
SPECIFICATIONS AND FEATURES	1
Mounting	2
Accessories	2
Model Options	3
THEORY OF OPERATION	4
General	4
Functional Description	4
OPERATING INSTRUCTIONS	6
Basic Mode of Operation	6
Mounting	6
Connections for Operation	6
Operation After Protective Device Shutdown	7
MAINTENANCE	8
General	8
Trouble Analysis	8
Checking Transistors and Capacitors	8
Printed Circuit Board Maintenance Techniques	8
Trouble Chart	9
Performance Check	10
Adjustment of Calibration Control R17	11
SERVICE	12
PARTS ORDERING	12
PARTS LIST	EE-1

SPECIFICATIONS AND FEATURES

The following specifications apply for all Lambda EE package LM power supplies. Specification exceptions noted here relate to models incorporating model option "Y" and/or "V". Performance specifications do not change for models with suffix "R", e.g., LM-EE2-R unless the models also include model options "Y" and/or "V" e.g., LM-EE2-YR; for these models the appropriate specification exceptions also apply.

NOTE: Specifications in italics apply only for Lambda models with a "Y" suffix, e.g., LM-EE2-Y. AC INPUT specification with an asterisk*, applies only for Lambda models with a "V" suffix, e.g., LM-EE2-YV.

DC OUTPUT--Voltage regulated for line and load

Voltage Range.... For voltage range see table I of pertinent model group.

Multi-Current Ratings... Current ratings specified for each maximum ambient temperature apply over entire output voltage range, with input frequency 55-65 cps. For input frequencies 45-55 at 105-132 VAC or 205-265 VAC delete 40° current rating.

For input frequencies 360-440 cps, consult factory for current ratings.

For maximum current ratings at each ambient temperature see table I of pertinent model group.

REGULATED VOLTAGE OUTPUT

Regulation (line)... Less than 0.05 percent plus 4.0 millivolts for input variations from 105-132 or 132-105 volts AC.
... Less than 0.01 percent plus 1.0 millivolt for input variations from 105-132 or 132-105 volts AC

Regulation (load)... Less than 0.03 percent plus 3.0 millivolts for load variations from 0 to full load or full loac to 0
... Less than 0.02 percent plus 2.0 millivolts for load variations from 0 to full load or full load to 0

Remote Programming

External Resistor... Nominal 200 ohms/volt output

Programming Voltage... One-to-one voltage change

Ripple and Noise... One millivolt rms; 3 millivolts peak-to-peak with 45-60 cps input
... 0.5 millivolt rms; 1.5 millivolts peak-to-peak with 45-60 cps input

Temperature Coefficient... Change in output voltage less than 0.03%/°C.
... Change in output voltage less than 0.01%/°C

AC INPUT--105-132 volts AC at 45-440 cps; 750 watts+
+With output loaded to full 40°C rating and input voltage 132 volts at 55-65 cps.
*... 205-265 volts AC at 45-440 cps or 187-242 volts AC at 45-440 cps ("V" option)

INPUT FUSE---"SLO-BLO" fuse F1 protects the AC input circuit. Overload of the supply does not cause fuse failure.

"SLO-BLO" fuse F2 (or, as applicable circuit breaker CB1) protects the load from excessive output current that can be caused by internal circuit failure.

For fuse ratings see table I of pertinent model group.

OVERLOAD PROTECTION

Thermal....Thermostat resets automatically when overtemperature condition is eliminated

Electrical...Within rated voltage range, an automatic electronic current-limiting circuit limits output current to approximately 110 percent of 40°C rated current for protection of load and power supply; for overloads approaching short circuit, both voltage and current decrease until at short circuit, current is reduced to a safe value, except for models LMEE-0-7, 0-14, 0-32 and 0-60, where output current remains limited to 110 percent of 40°C rated current at 40°C ambient.

OVERSHOOT--No overshoot of output voltage under conditions of power turn-on, power turn-off, or power failure.

INPUT AND OUTPUT CONNECTIONS--Heavy duty terminal blocks on rear of chassis.

OPERATING AMBIENT TEMPERATURE RANGE AND DUTY CYCLE--Continuous duty from -20°C to 71°C ambient with corresponding load current ratings for all modes of operation.

STORAGE TEMPERATURE -- -55°C to +85°C

CONTROLS

DC output control...Voltage adjust control permits adjustment of DC output voltage via access hole located in nameplate.

REMOTE SENSING--Provision is made for remote sensing to eliminate effect of power output lead resistance on DC regulation.

PHYSICAL DATA

Size.....4-15/16" Hx7-1/2"Wx16-1/2"D

Weight .....37 lbs. net; 47 lbs. shipping wt.

Finish .....Grey, FED STD 595 No. 26081

MOUNTING--Four tapped mounting holes on the base of the unit can be utilized for mounting. The unit must only be mounted with top facing up and in a horizontal plane. Refer to figure 9 for mounting details.

ACCESSORIES

Rack Adapter...Rack adapter LRA-7, used for ruggedized mounting, with or without chassis slides, is available for use with all LMEE package models.

Metered and Non-Metered Panels... Metered panel MP-50 and Non-Metered panel P-50 are available for use with the Lambda rack adapter.

Blank Panels... Full-rack, half-rack and quarter-rack panels can be used with the Lambda rack adapter. The following panels can be used with the LRA-7 rack adapter.

BLANK PANELS			
1/2 Rack	1/4 Rack	Full Rack	Metered/Non-Metered Panel
LBP-20	LBP-10	LBP-40	MP-50, P-50

Overvoltage Protector... Externally mounted, Overvoltage Protector LMOV-7, LMOV-8 and LMOV-9 are available for use with Lambda LM-EE3 through LM-EE48 power supplies. On models LMEE-0-7 through LMEE-0-60 use overvoltage protectors LHOV-4, LHOV-5, and LHOV-6.

MODEL OPTIONS

Suffix "Y" High Performance Option... All Lambda LM power supplies are available with high performance specifications. See italicized entries under SPECIFICATIONS AND FEATURES.

Suffix "R" Fungus Proofing Option... Standard LM power supplies can be obtained with fungus proofing treatment with MIL V 173 varnish for all fungi nutrient components.

Suffix "V" Input Option... Standard LM power supplies are available for operation with 205-265 volt, 45-440 cps input or 187-242 volt, 45-440 cps input. See nameplate for AC input rating. See schematic diagram for rewiring of AC input.

Suffix "S" Option... All LMEE power supplies may be used with a Systems Power Sequencer or Systems Power Protector. On all fixed voltage LMEE power supplies specified with the "S" option resistor R2 is jumped.

THEORY OF OPERATION

GENERAL

The Lambda power supply consists of an AC input circuit and transformer; a bias supply consisting of an auxiliary rectifier, filter, and a zener diode regulator; and a main regulator circuit consisting of the main rectifier and filter, a series regulator, emitter follower drivers, an error amplifier, a current limit amplifier, an output voltage sensing circuit and an output current sensing circuit. In addition, certain models also contain a voltage amplifier circuit.

The circuit arrangement is shown in block diagram form in figure 7. The circuitry is discussed with reference to the block diagram and the schematic diagram.

FUNCTIONAL DESCRIPTION

Single phase input power is applied to transformer T1 through the input circuit containing thermostat S1, which protects the supply against overheating.

The main rectifier, a full-wave rectifier, provides the power which is filtered by capacitors C18, C19 (or, as applicable C18 thru C20) and then regulated via a series regulator and delivered to the output. Bias supply, half-wave, auxiliary rectifier CR7, provides voltage filtered by capacitor C7 and regulated by zener diode CR6 for current limit amplifier Q3 and error amplifier Q1, Q2. Zener diode CR1 and resistor R5, across the bias supply, provide a regulated temperature compensated reference voltage. Resistor R4 compensates for input voltage variations.

Operation of the voltage regulator circuit is determined by changes in the output voltage. A change in the output voltage is sensed by the sensing divider resistors which compare output voltage with the +S reference voltage. This provides an error voltage at junction of R2 and R3 (or, as applicable, R1 and R3), which is amplified by error amplifier Q1 and Q2 and is current amplified by drivers Q5, Q6 (and, as applicable by Q8, Q9). The amplified signal from the drivers controls the voltage across series regulator Q10-Q13 and Q15-Q18, which functions as the active regulating element, restoring output voltage to the proper level.

*Current limit circuit operation is determined by changes in the load. Current limit amplifier Q3 samples load current through current sensing resistor R25A. When the voltage drop across this resistor increases compared with the preset voltage reference determined by R17 and R18, Q3 conducts. Thus, when the output current rating of the unit is exceeded, current limit amplifier Q3 conducts, decreasing the current through the drivers Q5, Q6, (and, as applicable by Q8, Q9), resulting in an increase of voltage across the series regulator and a decrease of the output voltage, effectively limiting the output current to a safe value. The current limit value is determined by the factory setting of current limit potentiometer R17.

When operating conditions approach short circuit, the output voltage decreases. Since the voltage determined by R17 and R18 is proportional to the output voltage, when the output voltage decreases, Q3 is biased into turn-on at lower and lower load currents until output voltage decreases to zero and current decreases to a predetermined low value.

*The following paragraph only applies for zero-volt units.

Current limit circuit operation is determined by changes in the load. When load current increases above the rated current value, the voltage drop across current limit potentiometer R17 increases, turning on current limit amplifier Q3. With Q3 conducting, the current to driver Q5 decreases, limiting the base current to series regulator Q10-Q13 and Q15-Q18, which results in an increase of voltage across the series regulator and a decrease of the output voltage, effectively limiting the output current to a safe value. The current limit value is determined by the factory setting of current limit potentiometer R17.

When operating conditions reach short circuit, the output voltage value decreases to zero and the current decreases to a predetermined current limit value and remains unchanged.

OPERATING INSTRUCTIONS

BASIC MODE OF OPERATION

This power supply operates as a constant voltage source provided the load current does not exceed the rated value at 40°C. For continuous operation, load current must not exceed the rating for each ambient temperature. *When load current exceeds 110% of 40°C rating, both voltage and current decrease until voltage reaches zero and the current at short circuit equals approximately 30 percent or less of the rated current.

*For models LMEE-07, LMEE-0-14, LMEE-0-32, and LMEE-0-60 output current remains limited to 110% to 40°C current rating.

MOUNTING

When using this unit as a mounted component, a cutout must be provided to permit free-flow of air through the unit. See figure 9 for cutout size and specific mounting details.

CONNECTIONS FOR OPERATION

NOTE: Make all connections to the unit before applying AC input power.

Ground Connections. The Lambda power supply can be operated either with negative or positive output terminal grounded. Both positive and negative ground connections are shown in the diagrams for all suggested output connections illustrated in this manual.

Connection Terminals. Make all connections to the supply at the terminal blocks on the rear of the supply. Apply input power to terminals 1 and 2; always connect the ungrounded (hot) lead to terminal 1.

The supply positive terminal is brought out to terminal 7; the negative terminal to terminal 6.

NOTE: When shipped from the factory, the supply is ready for use as a local-sensing constant voltage source. Jumpers are connected at the factory as shown in figure 3. Take care to remove the appropriate jumpers for load requirements that need different supply-load connections. Refer to the appropriate connection diagram.

Supply-Load Connections. The regulation of the supply at the load may change when connecting leads of practical length are used. To minimize the effect of the output load leads, remote sensing is used. Refer to figure 1 to determine voltage drop for particular cable lengths, wire size and current conditions. Lead lengths must be measured from supply terminals to load terminals as shown in figure 2.

Local-Sensing Connection, See Figure 3.

Remote-Sensing Connection, See Figure 4.

Programmed Voltage Connection Using External Resistor, See Figure 5. Discrete voltage steps can be programmed with a resistance voltage divider valued at nominal 200 ohms/volt and a shorting-type switch. For continuous voltage variations, use a variable resistor with

the same ohms/volt ratio in place of the voltage divider and shorting-type switch. Use low temperature coefficient resistor(s) to assure most stable operation.

Programmed Voltage Connection Using Programming Voltage, See Figure 6. The power supply voltage output can be programmed with an externally connected programming power supply. The output voltage of the programmed supply will maintain a one-to-one ratio with the voltage of the programming supply.

The programming supply must have a reverse current capability of 6 ma. minimum.

Alternatively, when supplies with less than 6 ma. reverse current capability are used, a resistor capable of drawing 6 ma. at the minimum programming voltage must be connected across the output terminals of the supply. This programming supply must be rated to handle all excess resistor current at the maximum programming voltage.

OPERATION AFTER PROTECTIVE DEVICE SHUTDOWN

Operation After Thermostat Shutdown. The thermostat opens the input circuit only when the power supply output current exceeds the current rating specified for the operating ambient temperature, causing the unit to overheat. Do not exceed current rating specified for the operating ambient temperature. When the temperature of the unit decreases to a safe operating value, the thermostat will reset automatically.

Operation After Fuse Shutdown. Internal component failure is prevented by fuses (and, as applicable, by circuit breaker CB1) which protect the components from damage caused by excessive currents. Fuses will blow when the maximum rated current value for the fuse is exceeded. Fatigue failure of fuses can occur when mechanical vibrations from the installation combine with thermally induced stresses to weaken the fuse metal. Many fuse failures are caused by a temporary condition and replacing the blown fuse will make the fuse protected circuit operative.

Operation After Circuit Breaker Shutdown (as applicable). Circuit breaker CB1 protects the components from damage caused by excessive currents. CB1 will trip when the maximum rated value of the circuit breaker is exceeded. If CB1 trips, check for cause and repair as necessary. To resume operation, place CB1 in ON position.

GENERAL

This section describes trouble analysis routine, calibration and test procedures that are useful for servicing the Lambda power supply. A trouble chart is provided as an aid for the troubleshooter. Refer to the section on specifications and features for the minimum performance standards.

TROUBLE ANALYSIS

Whenever trouble occurs, systematically check all fuses, primary power lines, external circuit elements, and external wiring for malfunction before trouble shooting the equipment. Failures and malfunctions often can be traced to simple causes such as improper jumpers and supply-load connections or fuse failure due to metal fatigue.

Use the electrical schematic diagram and block diagram, figure 7, as an aid to locating trouble causes. The schematic diagram contains various circuit voltages that are averages for normal no load operation. Measure these voltages using the conditions for measurement specified on the schematic diagram. Use measuring probes carefully to avoid causing short circuits and damaging circuit components.

CHECKING TRANSISTORS AND CAPACITORS

Check transistors with an in-circuit transistor checker. If no checker is available transistors can be checked with an ohmmeter that has a highly limited current capability. Observe proper polarity for PNP or NPN to avoid error in measurement. The forward transistor resistance is low but never ZERO; backward resistance is always higher than the forward resistance.

Do not assume trouble is eliminated when only one part is replaced. This is especially true when one transistor fails, causing other transistors to fail. Replacing only one transistor and turning power on, before checking for additional faulty components could damage the replaced component.

When soldering semi-conductor devices, hold the lead being soldered with a pair of pliers or a commercial heat sink device placed between the component and the solder joint.

NOTE: The leakage resistance obtained from a simple resistance check of a capacitor is not always an indication of a faulty capacitor. In all cases the capacitors are shunted with resistances, some of which have low value. Only a dead short is a true indication of a shorted capacitor.

PRINTED CIRCUIT BOARD MAINTENANCE TECHNIQUES

1. If foil is intact but not covered with solder it is a good contact. Do not attempt to cover with solder.

2. Voltage measurements can be made from either side of the board. Use a needle-point probe to penetrate to the wiring whenever a protective coating is used on the wiring. A brass probe can be soldered to an alligator clip adapted to measuring instrument.

3. Always use a heat sink when soldering transistors; a transistor pad with mounting feet is an effective heat sink.

4. Broken or damaged printed wiring is usually the result of an imperfection, strain or careless soldering. To repair small breaks, tin a short piece of hook-up wire to bridge the break, and holding the wire in place, flow solder along the length of wire so that it becomes part of the circuitry.

5. When unsoldering components from the board never pry or force loose the part; unsolder the component by using the wicking process described below:

   (a) Select a 3/16 inch tinned copper braid for use as a wick; if braid is not available, select AWG No. 14 or No. 16 stranded wire with 1/2 inch insulation removed.

   (b) Dip the wick in liquid rosin flux.

   (c) Place the wick onto the soldered connection and apply soldering iron onto the wick.

   (d) When sufficient amount of solder flows onto the wick, freeing the component, simultaneously remove iron and wick.

TROUBLE CHART

The trouble chart is intended as a guide for locating trouble causes, and is used along with the schematic diagram.

The operating conditions assumed for the trouble chart are as follows:

(a) AC power of proper voltage and frequency is present at input terminals.

(b) Either positive or negative terminal is connected to chassis ground.

(c) The power supply is connected for constant voltage with local sensing. See schematic; dotted lines indicate jumpers connected for local sensing operation.

TROUBLE CHART

Symptom	Probable Cause	Remedy
1. No output voltage	No power input, thermostat S1 open	Check power source, S1, line cord and line cord plug; shut off unit, allow to cool and check ambient temperature
	Improper output terminal connection	Refer to appropriate connection diagram, and check for correct connections
	Faulty Q2, Q3, CR1,CR6	Check Q2, Q3, CR1, CR6 for short and replace as required

TROUBLE CHART (Cont)

Symptom	Probable Cause	Remedy
2. No output voltage on units with CB1 (open CB1)	Faulty Q1, R1, Q10-Q13, Q15-Q18, Q5, Q6 (and Q8, Q9 as appl) or CR1	Check R1 for open; Q10-Q13, Q15-Q18, Q5, Q6 (and Q8, Q9) Q1 for short; CR1 for open and replace as required. Place CB1 in ON position.
3. Unable to adjust output voltage	Damaged VOLTAGE ADJUST control	Check R1 for shorts and/or open; replace as required
	Supply operating as constant current source at current limit value	Remove load, check load value and check for shorts and/or improper supply-load connections; refer to appropriate diagram for correct connections
4. Output voltage too high	Improper output terminal connection	Refer to appropriate connection diagram, and check for correct connections
	Faulty Q1, R1,Q10-Q13, Q15-Q18, Q5, Q6 (and Q8, Q9 as appl) or CR1	Check R1 for open; Q10-Q13, Q15-Q18, Q5, Q6 (and Q8, Q9) Q1 for short; CR1 for open and replace as required.
5. Output voltage too low	Load resistance improper for unit ratings	Check load resistance value
	Faulty Q2, Q3, R25A, R17	Check Q2, Q3 for short, R25A, R17 for open, replace as required
6. High ripple and unregulated DC output	Load resistance improper for unit ratings	Check load resistance value
7. High ripple	Improper ground	Connect terminal 6 or terminal 7 to ground terminal 4

PERFORMANCE CHECK

Check the ripple and regulation of the power supply using the test connection diagram shown in figure 8. Use suggested test equipment or equivalent to obtain accurate results. Refer to SPECIFICATIONS AND FEATURES for minimum performance standards.

Set the differential meter, DC VTVM (John Fluke Model 825A or equivalent) to the selected power supply operating voltage. Check the power supply load regulation accuracy while switching from the full load to no-load condition. Long load leads should be a twisted pair to minimize AC pick-up.

Use a Variac to vary the line voltage from 105-132 or 132-105 volts AC and check the power supply line regulation accuracy on the VTVM differential meter.

Use a VTVM, Ballantine 320 or equivalent, to measure rms ripple voltage of the power supply DC output. Use oscilloscope to measure peak-to-peak ripple voltage of the power supply DC output.

ADJUSTMENT OF CALIBRATION CONTROL R17

Whenever Q3, R25A or R17 are replaced, and voltage and current indications do not reflect maximum ratings, adjust R17 as follows:

For models LMEE-0-7, LMEE-0-14, LMEE-0-32, LMEE-0-60 adjustment is required only when R17 or R25A is replaced. The adjustment procedure requires that the power supply is removed from associated equipment, is at an ambient temperature of 25-30 °C, and is stabilized and not operating.

1. Remove AC power input to the supply.

2. Unsolder wiper of R17 from resistor housing and turn to full CW position.

3. Operate power supply for constant voltage with local sensing, connected as shown in figure 3, with no external load.

4. ** Turn voltage adjust control until minimum rated output voltage is obtained.

5. ** Apply load so that output current is 110% of 40 °C rating for the unit

6. ** Using an oscilloscope, Tektronix 503 or equivalent, observe output voltage while adjusting R17 in a CCW direction. Adjust R17 until output ripple increases sharply and oscilloscope pattern changes.

7. ** After adjustment is completed, remove AC power input to the supply and solder wiper of R17 to resistor housing.

8. ** After soldering, check setting and repeat adjustment procedure if required.

** Perform alternate steps 4A through 9A for adjustment of R17 on models LMEE-0-7, 0-14, 0-32, 0-60.

4A. Turn voltage adjust control until rated output voltage is obtained.

5A. Apply load so that output current is 130% to 40 °C rating for the unit.

6A. Using an oscilloscope, Tektronix 503 or equivalent, observe unit output voltage while adjusting R17 in a CCW direction. Adjust R17 until output ripple increases sharply and oscilloscope pattern changes.

7A. Place a DC ammeter of appropriate scale across output terminals 6 and 7 of the supply. The meter indication shall be a maximum of 133% of 40 °C rating for the unit.

8A. After adjustment is completed, remove AC power input to the supply and solder wiper of R17 to resistor housing.

9A. After soldering, check setting and repeat adjustment procedure if required.

SERVICE

When additional instructions are required or repair service is desired, contact the nearest office of the Lambda Electronics Corp. where trained personnel and complete facilities are ready to assist you.

Please include the power supply model and serial number together with complete details of the problem. On receipt of this information, Lambda will supply service data or advise shipping for factory repair service.

All repairs not covered by the warranty will be billed at cost and an estimate forwarded for approval before work is started.

PARTS ORDERING

Standard components and special components used in Lambda power supplies can be obtained from the factory. In case of emergency, critical spare parts are available through any Lambda office.

The following information must be included when ordering parts:

1. Model number and serial number of power supply and purchase date.

2. Lambda part number.

3. Description of part together with circuit designation.

4. If part is not an electronic part, or is not listed, provide a description, function, and location of the part.

PARTS LIST

The electrical parts located on all LM-EE models are listed here. Parts common to a group of LM-EE models are listed first. Unique parts of individual models within the group are listed separately, by model, immediately following the group common-parts listing. In addition there are separate listings of parts for the metered panel (MP) option, the Y option and the overvoltage protection (OV) option, as applicable, for all LM-EE models. Parts for the V option and R option are included at the end of this listing.

COMMON PARTS

MODELS LMEE-3 — LMEE-12

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
C1	Cap., mylar, 0.033 mf ± 10%, 400 vdc	CGL-33-006	$ .27
C2	Cap, mylar, 0.22 mf ± 10%, 80 vdc	CGM-22-004	.90
C3	Cap, elect., 3600 mf -10+100%, 35 vdc	CBS-36-058	4.50
C4	Cap., elect., 3 mf -10+75%, 100 vdc	CBN-30-015	1.58
C5	Cap., mylar, 0.018 mf ± 10% 200 vdc	CGL-18-005	.24
C6+	Cap., mylar, 0.0068 mf ± 10%, 200 vdc	CGK-68-001	.34
C7*	Cap., elect., 140 mf -10+100%, 38 vdc	CBR-14-030	2.25
C8+	Cap., mylar, 0.01 mf ± 10%, 80 vdc	CGL-10-008	.25
C9	Cap., mylar, 0.47 mf ± 10%, 80 vdc	CGM-47-016	1.00
C10	Same as C9		
C11	Not assigned		
C12+	Not assigned		
C13 thru C17	Not assigned		
C30	Cap., mylar, 0.022 mf ± 10%, 200 vdc	CGL-22-001	.39
CB1+	Circuit breaker	FHB-40-000-2	10.59
CR1*	Rectifier, zener diode	FBM-Z104	4.35
CR2	Rectifier	FBL-00-030	1.40
CR3	Same as CR2		

COMMON PARTS (Cont)

MODELS LMEE-3 — LMEE-12 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
CR4, CR5	Not assigned		$
CR6	Rectifier, zener diode	FBM-Z103	4.87
CR7	Same as CR2		
CR8	Rectifier	FBL-00-083	3.57
CR9	Not assigned		
CR10	Same as CR8		
CR11 thru CR20	Not assigned		
CR21 thru CR28	Same as CR2		
Q1 thru Q3	Transistor, NPN	FBN-L110	3.25
Q4	Not assigned		
Q5+	Transistor, NPN	FBN-L113	1.96
Q6	Transistor, NPN	FBN-36485	4.13
Q7	Not assigned		
Q10+ thru Q13	Transistor, NPN	FBN-36972	6.50
Q14	Not assigned		
Q15+ thru Q18	Same as Q10-Q13		
R3	Res., ww, 1200 ohms ± 3%, 2w	DFS-12-030	.90
R4*	Res., film, 15,000 ohms ± 2%, 1/2w	DCT-15-013	.30
R5	Res., film, 220 ohms, ± 2%, 1/2w	DCR-22-005	.30
R6	Res., comp., 180,000 ohms ±10%, 1/2w	DEB-1841	.12

COMMON PARTS (Cont)

MODELS LMEE-3 — LMEE-12 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
R7	Res., film, 3900 ohms ±5%, 1/2w	DCS-39-014	$ .25
R8	Res., comp., 4700 ohms ±10%, 1/2w	DEB-4721	.12
R9	Res., comp., 150 ohms ±10%, 1/4w	DCB-1511	.10
R10	Res., comp., 2200 ohms, ±10%, 1/2w	DEB-2221	.12
R11+	Res., comp., 15,000 ohms ±10%, 1/4w	DEB-1531	.12
R12	Res., comp., 47 ohms ±10%, 1/2w	DEB-4701	.12
R13*	Res., ww, 600 ohms ±3%, 3w	DFR-60-005	.89
R14, R15	Not assigned		
R16+	Res., comp., 560 ohms ±10%, 1/2w	DEB-5611	.12
R17	Res., ww, var., 1200 ohms ± 10% 1-1/2w	DNS-12-026	1.25
R19 thru R21	Not assigned		
R22	Res., comp., 220 ohms ± ±10%, 1/2w	DEB-2211	.12
R23	Res., comp., 22 ohms ±10%, 1/2w	DEB-2201	.12
R27	Not assigned		
R30 thru R39	Not assigned		
R40	Res., comp., 470 ohms ± 10% 2w	DHB-4711	.15
S1	Thermostat	FKA-155-020	2.15
XF1	Fuseholder	HRM-00-009	.12

*This part not used on units with "Y" option.
+This part differs on model LMEE-12; see LMEE-12 unique parts list.

UNIQUE PARTS

MODEL LMEE-3

C18 thru C20	Cap., elect., 25,000 mf., -10 + 100% 20 vdc	CBT-25-011	12.88
F1	Fuse "SLO-BLO", 10 amps	FFC-10-000	.21

UNIQUE PARTS (Cont)

MODEL LMEE-3 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
R1	Res., ww, var., 300 ohms ±5%, 5w	DNR-30-016	$ 1.95
R2	Res., ww, 430 ohms ±3%, 3w	DFR-43-058	.50
R18	Not assigned		
R24	Res., film, 68 ohms ± 10%, 2w	DCP-68-004	.15
R25A, B; R26A, B; R28A, B; R29A, B;	Res., ww 0.18 ohms ±5%, 11w/section	DFM-36-049	1.60
T1	Transformer	ABA-EE-3	101.50

MODEL LM-3P6

C18 thru C20	Cap., elect., 25,000 mf, -10 + 100% 20 vdc	CBT-25-011	12.28
F1	Fuse "SLO-BLO", 10 amps	FFC-10-000	.21
R1	Res., ww, var., 600 ohms ±5% 5w	DNR-60-028	2.75
R2	Res., ww, 430 ohms ±3%, 3w	DFR-43-058	.50
R18	Not assigned		
R24	Res., film, 68 ohms ±10%, 2w	DCP-68-004	.15
R25A, B; R26A, B; R28A, B; R29A, B;	Res., ww 0.18 ohms ±5%, 11w/section	DFM-36-049	1.60
T1	Transformer	ABA-EE-4	101.50

MODEL LMEE-4

C18 thru C20	Cap., elect., 25,000 mf, -10 +100%, 20 vdc	CBT-25-011	12.28
F1	Fuse "SLO-BLO", 10 amps	FFC-10-000	.21
R1	Res., ww, var., 600 ohms ±5%, 5w	DNR-60-028	2.75
R2	Res., ww, 600 ohms ±3%, 3w	DFR-60-005	.89
R18	Not assigned		
R24	Res., film, 68 ohms ±10%, 2w	DCP-68-004	.15
R25A, B; R26A, B; R28A, B; R29A, B;	Res., ww 0.18 ohms ±5%, 11w/section	DFM-36-049	1.60
T1	Transformer	ABA-EE-4	101.50

UNIQUE PARTS (Cont)

MODEL LMEE-4P5

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
C18 thru C20	Cap., elect., 25,000 mf, -10 +100% 20 vdc	CBT-25-011	$ 12.28
F1	Fuse "SLO-BLO", 10 amps	FFC-10-000	.21
R1	Res., ww, var., 300 ohms ±5%, 5w	DNR-30-016	1.95
R2	Res., ww, 650 ohms ±3%, 3w	DFR-65-062	1.00
R18	Res., film, 390 ohms ±5%, 1/2w	DCR-39-004	.20
R24	Res., film, 180 ohms ±10%, 2w	DCR-18-012	.20
R25A, B; R26A, B; R28A, B; R29A, B	Res., ww, 0.18 ohms ±5%, 11w/ section	DFM-36-049	1.60
T1	Transformer	ABA-EE-5	101.50

MODEL LMEE-5

C18 thru C20	Cap., elect., 25,000 mf, -10 +100%, 20 vdc	CBT-25-011	12.28
F1	Fuse "SLO-BLO", 10 amps	FFC-10-000	.21
R1	Res., ww, var., 600 ohms ±5%, 5w	DNR-60-028	2.75
R2	Res., ww, 650 ohms ±3%, 3w	DFR-65-062	1.00
R18	Res., film, 1300 ohms ±5%, 1/2w	DCS-13-010	.25
R24	Res., film, 180 ohms ±10%, 2w	DCR-18-012	.20
R25A, B; R26A, B; R28A, B; R29A, B	Res., ww, 0.18 ohms ±5%, 11w/ section	DFM-36-049	1.60
T1	Transformer	ABA-EE-5	101.50

MODEL LMEE-6

C18 thru C20	Cap., elect., 25,000 mf, -10 +100%, 20 vdc	CBT-25-011	12.28
F1	Fuse "SLO-BLO", 15 amps	FFC-15-000	.18
R1	Res., ww, var., 600 ohms, ±5%, 5w	DNR-60-028	2.75
R2	Res., ww, 800 ohms ±3%, 2w	DFR-80-037	.84

UNIQUE PARTS (Cont)

MODEL LMEE-6 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
R18	Res., film, 1300 ohms ±5%, 1/2w	DCS-13-010	$ .25
R24	Res., film, 180 ohms ±10%, 2w	DCR-18-012	.20
R25A, B; R26A, B; R28A, B; R29A, B	Res., ww, 0.18 ohms ±5%, 11w/ section	DFM-36-049	1.60
T1	Transformer	ABA-EE-6	101.50

MODEL LMEE-8

C18 thru C20	Cap., elect., 25,000 mf, -10 +100%, 20 vdc	CBT-25-011	12.28
F1	Fuse "SLO-BLO", 15 amps	FFC-15-000	.18
R1	Res., ww, var., 1000 ohms ±5%, 5w	DNS-10-027	1.50
R2	Res., ww, 1200 ohms ±3%, 2w	DFS-12-030	.90
R18	Res., film, 2400 ohms ±5%, 1/2w	DCS-24-001	.25
R24	Res., film, 180 ohms ±10%, 2w	DCR-18-012	.20
R25A, B; R26A, B; R28A, B; R29A, B	Res., ww 0.18 ohms, ±5%, 11w/section	DFM-35-049	1.60
T1	Transformer	ABA-EE-8	101.50

MODEL LMEE-10

C18 thru C20	Cap., elect., 14,000 mf, -10+100%, 35 vdc	CBT-14-012	12.28
F1	Fuse "SLO-BLO", 15 amps	FFC-15-000	.18
R1	Res., ww, var., 2200 ohms ±5%, 5w	DNS-22-056	2.75
R2	Res., ww, 1200 ohms ±3%, 2w	DFS-12-030	.90
R18	Not assigned		
R24	Res., film, 68 ohms ±10%, 2w	DCP-68-004	.15
R25A, B; R26A, B; R28A, B; R29A, B	Res., ww 0.30 ohms ±5%, 11w/ section	DFM-60-050	1.45
T1	Transformer	ABA-EE-10	101.50

UNIQUE PARTS (Cont)

MODEL LMEE-12

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
C6	Cap., mylar, 0.018 mf ±10%, 200 vdc	CGL-18-005	.24
C8	Not assigned		
C12	Cap., mylar, 0.001 mf ±10%, 200 vdc	CGK-10-004	.21
C18 thru C20	Cap., elect., 14,000 mf -10 +100%, 35 vdc	CBT-14-012	12.28
F1	Fuse "SLO-BLO", 15 amperes	FFC-15-000	.18
F2	Fuse, 40 amperes	FFE-40-000	.25
Q5	Transistor, NPN	FBN-L109	2.75
Q10 thru Q13, Q15 thru Q18	Transistor, NPN	FBN-36220	6.60
R1	Res., ww, var., 2200 ohms ±5%, 5w	DNS-22-056	2.75
R2	Res., ww, 1800 ohms ±3%, 3w	DFS-18-048	.60
R11	Res., comp., 22,000 ohms ±10%, 1/2w	DEB-2231	.12
R16	Res., comp., 330 ohms ±10%, 1/2w	DEB-3311	.12
R18	Res., film, 2400 ohms ±5%, 1/2w	DCS-24-001	.25
R24	Res., film, 470 ohms ±10%, 2w	DCR-47-013	.15
R25A, B; R26A, B; R28A, B; R29A, B	Res., ww, 0.47 ohms ±5%, 8 w/section	DFM-94-051	3.30
T1	Transformer	ABA-EE-12	101.50
XF2	Fuseholder	HRM-00-003	.40

COMMON PARTS

MODELS LMEE-15 — LMEE-48

C1	Cap., mylar, 0.033 mf ±10%, 400 vdc	CGL-33-006	.27
C2+	Cap., mylar, 0.22 mf ±10%, 80 vdc	CGM-22-004	.90
C4	Cap., elect., 3.0 mf -10 +75%, 100 vdc	CBN-30-015	1.58

COMMON PARTS (Cont)

MODELS LMEE-15 — LMEE-48 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
C5+	Cap., mylar, 0.018 mf ±10%, 200 vdc	CGL-18-005	.24
C6+	Same as C5		
C7*	Cap., elect., 140 mf -10 +100%, 38 vdc	CBR-14-030	2.38
C8**	Not assigned		
C9	Not assigned		
C10	Not assigned		
C11	Cap., mylar, 0.22 mf ±10%, 200 vdc	CGM-22-002	.41
C12**	Cap., mylar, 0.001 mf, ±10%, 200 vdc	CGK-10-004	.21
C13 thru C17	Not assigned		
C30	Cap., mylar, 0.022 mf ±10%, 200 vdc	CGL-22-001	.39
CR1*	Rectifier, zener diode	FBM-Z104	4.35
CR2	Rectifier	FBL-00-030	1.40
CR3	Same as CR2		
CR4, CR5	Not assigned		
CR6	Rectifier, zener diode	FBM-Z103	4.87
CR7	Same as CR2		
CR8 thru CR11	Rectifier	FBL-00-083	3.57
F1	Fuse, "SLO-BLO" 15 amperes	FFC-15-000	.18
Q1 thru Q3	Transistor, NPN	FBN-L110	3.25
Q4	Not assigned		
Q5+	Transistor NPN	FBN-L109	2.75
Q7	Not assigned		
Q14	Not assigned		
R3	Res., ww, 1200 ohms ±3%, 2w	DFS-12-030	.90
R4*	Res., film, 15,000 ohms ±2%, 1/2w	DCT-15-013	.30
R5	Res., film, 220 ohms ±2%, 1/2w	DCR-22-005	.30
R6	Res., comp., 180,000 ohms ±10%, 1/2w	DEB-1841	.12
R7	Res., film, 3900 ohms ±5%, 1/2w	DCS-39-014	.25
R8	Res., comp., 4700 ohms ±10%, 1/2w	DEB-4721	.12

COMMON PARTS (Cont)

MODELS LMEE-15 — LMEE-48 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
R9**	Res., comp., 150 ohms ±10%, 1/4w	DCB-1511	$ .10
R10	Res., comp., 2200 ohms ±10%, 1/2w	DEB-2221	.12
R11**	Res., comp., 22,000 ohms ±10%, 1/2w	DEB-2231	.12
R12	Res., comp., 47 ohms ±10%, 1/2w	DEB-4701	.12
R13*	Res., ww, 600 ohms ±3%, 3w	DFR-60-005	.89
R14, R15	Not assigned		
R16+	Res., comp., 330 ohms ±10%, 1/2w	DEB-3311	.12
R17	Res., ww, var., 1200 ohms ±10%, 1-1/2w	DNS-12-026	1.25
R19 thru R21	Not assigned		
R22	Res., comp., 220 ohms ±10%, 1/2w	DEB-2211	.12
R23	Res., comp., 22 ohms ±10%, 1/2w	DEB-2201	.12
R27	Not assigned		
R30 thru R39	Not assigned		
S1	Thermostat	FKA-155-020	2.15
XF1	Fuseholder	HRM-00-009	.12
XF2	Fuseholder	HRM-00-003	.40

*This part not used on units with "Y" option.
+This part differs on model LMEE-48; see LMEE-48 unique parts list.
**These parts differ on models LMEE-24 and LMEE-28; see unique parts list.

UNIQUE PARTS

MODEL LMEE-15

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
C3	Cap., elect., 3600 mf -10 +100%, 35 vdc	CBS-36-058	4.50
C18 thru C20	Cap., elect., 14,000 mf -10 +100% 35 vdc	CBT-14-012	12.28
CR21 thru CR28	Rectifier	FBL-00-030	1.40
F2	Fuse, 40 amperes	FFE-40-000	.25
Q6	Transistor, NPN	FBN-36485	4.13

UNIQUE PARTS (Cont)

MODEL LMEE-15 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
Q10 thru Q13, Q15 thru Q18	Transistor, NPN	FBN-36220	$ 6.60
R1	Res., ww, var., 2200 ohms ±5%, 5w	DNS-22-056	2.75
R2	Res., ww, 1800 ohms ±3%, 3w	DFS-18-048	.60
R18	Res., film, 2400 ohms ±5%, 1/2w	DCS-24-001	.25
R24	Res., film, 470 ohms ±10%, 2w	DCR-47-013	.15
R25A, B; R26A, B; R28A, B; R29A, B;	Res., ww, two section, 0.30 ohms ±5%, 11w/ section	DFM-60-050	1.45
R40	Res., comp., 1000 ohms ±10%, 2w	DHB-1021	.15
T1	Transformer	ABA-EE-15	101.50

MODEL LMEE-18

C3	Cap., elect., 3600 mf -10 +100% 35 vdc	CBS-36-058	4.50
C18 thru C20	Cap., elect., 14,000 mf -10 +100% 35 vdc	CBT-14-012	12.28
CR21 thru CR28	Rectifier	FBL-00-030	1.40
F2	Fuse, 40 amperes	FFE-40-000	.25
Q6	Transistor, NPN	FBN-36220	6.60
Q10 thru Q13 Q15, thru Q18	Same as Q6		
R1	Res., ww, var., 2200 ohms ±5%, 5w	DNS-22-056	2.75
R2	Res., ww, 2500 ohms ±3%, 3w	DFS-25-036	.53
R18	Res., film, 6800 ohms ±5%, 1/2w	DCS-68-021	.25

UNIQUE PARTS (Cont)

MODEL LMEE-18 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
R24	Res., comp., 680 ohms ±10%, 2w	DHB-6811	$ .15
R25A,B; R26A,B; R28A,B; R29A,B	Res., ww, two section, 0.75 ohms ±5%, 8w/ section	DFN-15-056	1.50
R40	Res., comp., 1000 ohms ±10%, 2w	DHB-1021	.15
T1	Transformer	ABA-EE-18	101.50

MODEL LMEE-20

C3	Cap., elect., 2000 mf -10 +100%, 60 vdc	CBS-20-057	4.50
C18 thru C20	Cap., elect., 7800 mf -10 +100% 60 vdc	CBS-78-045	8.18
CR21 thru CR28	Rectifier	FBL-00-030	1.40
F2	Fuse, 40 amperes	FFE-40-000	.25
Q6	Transistor, NPN	FBN-36220	6.60
Q10 thru Q13, Q15 thru Q18	Same as Q6		
R1	Res., ww, var., 2200 ohms ±5%, 5w	DNS-22-056	2.75
R2	Res., ww, 2500 ohms ±3%, 3w	DFS-25-036	.53
R18	Res., film, 6800 ohms ±5%, 1/2w	DCS-68-021	.25
R24	Res., comp., 680 ohms ±10%, 2w	DHB-6811	.15
R25A,B; R26A,B; R28A,B; R29A,B	Res., ww, two section, 0.75 ohms ±5%, 8w/ section	DFN-15-056	1.50
R40	Res., comp., 1000 ohms ±10%, 2w	DHB-1021	.15
T1	Transformer	ABA-EE-20	101.50

MODEL LMEE-24

C3	Cap., elect., 2000 mf -10 +100%, 60 vdc	CBS-20-057	$ 4.50
C8	Cap. mylar 0.01mf ±10%, 80 vdc	CGL-10-008	.25
C12	Cap., ceramic, 240 pf, 1KV	CDJ-24-001	.12

UNIQUE PARTS (Cont)

MODEL LMEE-24 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
C18 thru C20	Cap., elect., 7800 mf -10 +100%, 60 vdc	CBS-78-045	8.18
F2	Fuse, 30 amperes	FFE-30-000	.20
Q6	Transistor, NPN	FBN-36220	6.60
Q10 thru Q13, Q15 thru Q18	Same as Q6		
R1	Res., ww, var., 2200 ohms ±5%, 5w	DNS-22-056	2.75
R2	Res., ww, 3600 ohms ±3%, 3w	DFS-36-050	.60
R9	Res. comp 27 ohm ±10%, 1/4w	DEB-2701	.10
R11	Res. comp. 15,000 ohm ±10%, 1/4w	DEB-1531	.10
R18	Res., film, 6800 ohms ±5%, 1/2w	DCS-68-021	.25
R24	Res., comp., 1000 ohms ±10%, 2w	DHB-1021	.15
R25A,B; R26A,B; R28A,B; R29A,B	Res., ww, two section, 0.30 ohms ±5%, 11w/ section	DFM-60-050	1.45
R40	Res., comp., 5600 ohms ±10%, 2w	DHB-5621	.50
T1	Transformer	ABA-EE-24	101.50

MODEL LMEE-28

C3	Cap., elect., 2000 mf -10 +100%, 60 vdc	CBS-20-057	4.50
C8	Cap. mylar 0.01 mf ±10%, 80 vdc	CGL-10-008	.25
C12	Cap., ceramic 240 pf, 1KV	CDJ-24-001	.12
C18 thru C20	Cap., elect., 7800 mf -10 +100%, 60 vdc	CBS-78-045	8.18
F2	Fuse, 30 amperes	FFE-30-000	.20
Q6	Transistor	FBN-36220	6.60
Q10 thru Q13, Q15 thru Q18	Same as Q6		
R1	Res., ww, var., 2200 ohms ±5%, 5w	DNS-22-056	2.75
R2	Res., ww, 4500 ohms ±3%, 3w	DFS-45-044	.87

UNIQUE PARTS (Cont)

MODEL LMEE-28 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
R9	Res. comp. 27 ohm ±10% 1/4w	DCB-2701	.10
R11	Res. comp. 15,000 ohm ±10%, 1/4 w	DEB-1531	.10
R18	Res., film, 6800 ohms ±5%, 1/2w	DCS-68-021	.25
R24	Res., comp., 1000 ohms ±10%, 2w	DHB-1021	.15
R25A, B; R26A, B; R28A, B; R29A, B	Res., ww, two section, 0.47 ohms ±5%, 8w/ section	DFM-94-051	3.30
R40	Res., comp., 5600 ohms ±10%, 2w	DHB-5621	.50
T1	Transformer	ABA-EE-28	101.50

MODEL LMEE-36

C3	Cap., elect., 2000 mf -10 +100% 60 vdc	CBS-20-057	4.50
C18 thru C20	Cap., elect., 7800 mf -10 +100% 60 vdc	CBS-78-045	8.18
F2	Fuse, 20 amperes	FFE-20-000	.18
Q6	Transistor, NPN	FBN-36220	6.60
Q10 thru Q13, Q15 thru Q18	Same as Q6		
R1	Res., ww, var., 3300 ohms ±5%, 5w	DNS-33-057	3.00
R2	Res., ww, 5600 ohms ±3%, 3w	DFS-56-053	.60
R18	Res., film, 10,000 ohms ±5%, 1/2w	DCT-10-008	.25
R24	Res., comp., 1500 ohms ±10%, 2w	DHB-1521	.24
R25A, B; R26A, B; R28A, B; R29A, B	Res., ww, two section, 0.47 ohms ±5%, 8w/ section	DFM-94-051	3.30
R40	Res., comp., 5600 ohms ±10%, 2w	DHB-5621	.50
T1	Transformer	ABA-EE-36	101.50

UNIQUE PARTS (Cont)

MODEL LMEE-48

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
C2	Cap., mylar, 0.22 mf ±10%, 200 vdc	CGM-22-002	$ .41
C3	Cap., elect., 880 mf -10 +100%, 100 vdc	CBR-88-060	4.50
C5	Cap., mylar 0.047mf ±10%, 80 vdc	CGL-47-013	.35
C6	Cap., mylar 0.0022 mf 200 vdc	CGK-22-008	.25
C18 thru C20	Cap., elect., 3000 mf -10 +100%, 100 vdc	CBS-30-047	11.16
F2	Fuse, 20 amperes	FFE-20-000	.25
Q5	Transistor, NPN	FBN-L108	2.52
Q6	Transistor, NPN	FBN-36487	5.63
Q10 thru Q13, Q15 thru Q18	Same as Q6		
R1	Res., ww, var., 3300 ohms ±5%, 5w	DNS-33-057	3.00
R2	Res., ww, 8000 ohms ±3%, 3w	DFS-80-054	1.03
R16	Res., comp., 1000 ohms ±10%, 1/2w	DEB-1021	.12
R18	Res., film, 10,000 ohms ±5%, 1/2w	DCT-10-008	.25
R24	Res., comp., 1800 ohms ±5%, 2w	DHB-1825	.25
R25A, B; R26A, B; R28A, B; R29A, B	Res., ww, two section, 0.75 ohms ±5%, 8w/ section	DFM-94-051	3.30
R40	Res., comp., 5600 ohms ±10%, 2w	DHB-5621	.50
T1	Transformer	ABA-EE-48	101.50

COMMON PARTS

MODELS LMEE-100 — LMEE-150

C1	Cap., mylar, 0.033 mf ±10%, 400 vdc	CGL-33-006	.27
C3	Cap., elect., 320 mf -10 +100%, 250 vdc	CBR-32-058	4.50
C4	Cap., elect., 3.5 mf -10 +100%, 300 vdc	CBN-35-018	1.12
C5	Cap., mylar, 0.018 mf ±10%, 200 vdc	CGL-18-005	.24

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
C6	Cap., mylar, 0.001 mf ±10%, 200 vdc	CGK-10-004	$ .21
C7*	Cap., elect., 140 mf -10 +100%, 38 vdc	CBR-14-030	2.25
C8 thru C10	Not assigned		
C11	Cap., paper, 0.15 mf ±20%, 400 vdc	CAM-15-015	1.60
C12	Not assigned		
C13	Cap., mylar, 0.01 mf ±10%, 200 vdc	CGL-10-002	.36
C14	Same as C13		
C15 thru C17	Not assigned		
C18	Cap., elect., 1200 mf -10 +100%, 250 vdc	CBS-12-048	11.16
C19	Same as C18		
C30	Cap., mylar, 0.022 mf ±10%, 200 vdc	CGL-22-001	.39
CR1*	Rectifier, zener diode	FBM-Z104	4.35
CR2	Rectifier	FBL-00-030	1.40
CR3	Same as CR2		
CR4, CR5	Not assigned		
CR6	Rectifier, zener diode	FBM-Z103	4.87
CR7	Same as CR2		
CR8 thru CR11	Rectifier	FBL-00-052	3.00
CR12 thru CR17	Not assigned		
CR18	Rectifier	FBL-00-064	.75
CR19	Rectifier	FBM-Z104	4.35
F1	Fuse, "SLO-BLO", 15 amperes	FFC-15-000	.18
Q1 thru Q3	Transistor, NPN	FBN-L110	3.25
Q4	Not assigned		
Q6	Transistor, NPN	FBN-35903	5.17
Q7	Not assigned		
Q9	Same as Q6		
Q10 thru Q13	Transistor	FBN-35902	9.90
Q14	Not assigned		

COMMON PARTS (Cont)

MODELS LMEE-100 — LMEE-150 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
Q15 thru Q18	Same as Q10 thru Q13		$
R1	Res., ww, var., 9000 ohms ±5%, 5w	DNS-90-058	3.00
R3	Res., ww, 1200 ohms ±3%, 2w	DFS-12-030	.90
R4*	Res., film, 15,000 ohms ±2%, 1/2w	DCT-15-013	.30
R5	Res., film, 220 ohms ±2%, 1/2w	DCR-22-005	.30
R6	Res., comp., 180,000 ohms ±10%, 1/2w	DEB-1841	.12
R7	Res., film, 3900 ohms ±5%, 1/2w	DCS-39-014	.25
R8	Res., comp., 4700 ohms ±10%, 1/2w	DEB-4721	.12
R10	Res., comp., 3900 ohms ±10%, 1/2w	DEB-3921	.12
R11	Res., 22,000 ohms ±10%, 1/2w	DEB-2231	.12
R12	Res., comp., 47 ohms ±10%, 1/2w	DEB-4701	.12
R13*	Res., ww., 600 ohms ±3%, 3w	DFR-60-005	.89
R14, R15	Not assigned		
R16	Res., comp., 560 ohms ±10%, 1/2w	DEB-5611	.12
R17	Res., ww, var., 1200 ohms ±10%, 1-1/2w	DNS-12-026	1.25
R19 thru R21	Not assigned		
R22	Res., comp., 220 ohms ±10%, 1/2w	DEB-2211	.12
R23	Res., comp., 22 ohms ±10%, 1/2w	DEB-2201	.12
R25A, B; R26A, B	Res., ww, 1.5 ohms ±5%, 8w/ section	DFN-30-057	2.04
R27	Same as R22		

COMMON PARTS (Cont)

MODELS LMEE-100 — LMEE-150 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
			$
R28A, B; R29A, B	Same as R25A, B and R26A, B		
R30 thru R35	Not assigned		
R36	Res., ww, 8000 ohms ±3%, 3w	DFS-80-054	1.03
R37	Same as R36		
R38	Same as R23		
R39	Res., comp., 2200 ohms ±10%, 1/2w	DEB-2221	.12
R40	Res., comp., 56,000 ohms ±10%, 2w	DHB-5631	.20
S1	Thermostat	FKA-137-014	5.00
XF1	Fuseholder	HRM-00-009	.12

*This part not used on units with "Y" option.

UNIQUE PARTS

MODEL LMEE-100

C2	Cap., mylar, 0.15 mf ±10%, 200 vdc	CGM-15-005	.40
Q5	Transistor, NPN	FBN-L108	2.52
Q8	Same as Q5		
R2	Res., ww, 16,000 ohms ±3%, 5w	DFT-16-039	.85
R9	Res., comp., 150 ohms ±10% ¼w	DCB-1511	.10
R18	Res., film, 39,000 ohms ±5%, 1/2w	DCT-39-015	.30
R24	Res., comp., 10,000 ohms ±10%, 2w	DHB-1031	.13
T1	Transformer	ABA-EE-100	101.50

MODEL LMEE-120

C2	Cap., mylar, 0.15 mf ±10%, 200 vdc	CGM-15-005	.40
Q5	Transistor, NPN	FBN-L108	2.52
Q8	Same as Q5		
R2	Res., ww, 20,000 ohms ±3%, 5w	DFT-20-040	.85
R9	Res., comp., 820 ohms ±10% ¼w	DCB-8211	.06
R18	Res., film, 43,000 ohms ±5%, 1/2w	DCT-43-016	.30
R24	Res., film, 12,000 ohms ±10%, 2w	DCT-12-022	.40
T1	Transformer	ABA-EE-120	101.50

UNIQUE PARTS (Cont)

MODEL LMEE-150

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
C2	Cap., mylar, 0.15 mf ±2%, 400 vdc	CAM-15-015	$ 1.60
Q5	Transistor, NPN	FBN-L115	2.25
Q8	Same as Q5		
R2	Res., ww, 26,000 ohms ±3%, 5w	DFT-26-041	1.20
R9	Res., comp., 150 ohms ±10% ¼w	DCB-1511	.10
R18	Res., film, 56,000 ohms ±5%, 1/2w	DCT-56-024	.30
R24	Res., film, 12,000 ohms ±10%, 2w	DCT-12-022	.40
T1	Transformer	ABA-EE-150	101.50

COMMON PARTS

MODELS LMEE-0-7 — LMEE-0-60

C1	Cap., mylar 0.033 mf ±10%, 400 vdc	CGL-33-006	.27
C2+	Cap., mylar, 0.22 mf ± 10%, 80 vdc	CGM-22-004	.90
C4	Cap., elect., 3.0 mf -10 +75%, 100 vdc	CBN-30-015	1.58
C5	Cap., mylar, 0.018 mf ±10%, 200 vdc	CGL-18-005	.24
C6	Cap., mylar, 0.01 mf ±10%, 200 vdc	CGL-10-002	.36
C7*	Cap., elect., 140 mf -10 +100%, 38 vdc	CBR-14-030	2.25
C9	Cap., mylar, 0.22 mf ±10%, 200 vdc	CGM-22-002	.41
C10	Same as C9		
C11, C13 thru C17, C20 thru C29	Not assigned		
C30	Cap., mylar, 0.022 mf ±10%, 200 vdc	CGL-22-001	.39
CR1*	Rectifier, zener diode	FBM-Z104	4.35
CR2	Rectifier	FBL-00-030	1.40
CR3 thru CR5	Not assigned		
CR6	Rectifier, zener diode	FBM-Z103	4.87
CR7	Same as CR2		
CR8	Rectifier	FBL-00-054	1.35
CR9	Same as CR8		

MODELS LMEE-0-7 — LMEE-0-60 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
CR10, CR11	Not assigned		$
CR12	Rectifier	FBL-00-083	3.57
CR13 thru CR17	Not assigned		
Q1 thru Q3	Transistor, NPN	FBN-L110	3.25
Q4	Not assigned		
Q7 thru Q9	Not assigned		
Q14	Not assigned		
R2	Not assigned		
R3	Res., ww, 1100 ohms ±3%, 2w	DFS-11-061	.60
R4*	Res., film, 15,000 ohms ±2%, 1/2w	DCT-15-013	.30
R5	Res., film, 220 ohms ±2%, 1/2	DCR-22-005	.30
R6	Res., comp., 180,000 ohms ±10%, 1/2w	DEB-1841	.12
R7	Res., film, 3900 ohms ±5%, 1/2w	DCS-39-014	.25
R8	Res., comp., 4700 ohms ±10%, 1/2w	DEB-4721	.12
R9+	Res., comp., 68 ohms ±10%, 1/2w	DEB-6801	.12
R10	Res., comp., 2200 ohms ±10%, ±1/2w	DEB-2221	.12
R11, R12	Not assigned		
R13*	Res., ww, 600 ohms ±3%, 3w	DFR-60-005	.89
R14, R15	Not assigned		
R16	Res., comp., 3300 ohms ±10%, 1/2w	DEB-3321	.12
R17	Res., ww, var., 1200 ohms ±10%, 1-1/2w	DNS-12-026	1.25
R18, R19	Not assigned		
R21	Not assigned		
R22	Res., comp., 220 ohms ±10%, 1/2w	DEB-2211	.12
R23	Res., comp., 22 ohms ±10%, 1/2w	DEB-2201	.12
R24, R27, R30 thru R39	Not assigned		
S1	Thermostat	FKA-155-020	2.15
XF1	Fuseholder	HRM-00-009	.12

MODELS LMEE-0-7 — LMEE-0-60 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
XF2	Fuseholder	HRM-00-003	$ .40

*This part not used on units with "Y" option.
+This part differs on LMEE-0-60, see LMEE-0-60 unique parts list.

UNIQUE PARTS

MODEL LMEE-0-7

C3	Cap., elect., 2000 mf -10 +100%, 60 vdc	CBS-20-057	4.50
C8, C12	Not assigned		
C18	Cap., elect., 25,000 mf -10+100%, 20 vdc	CBT-25-011	12.28
C19	Same as C18		
CR18, CR19	Not assigned		
F1	Fuse, "SLO-BLO", 10 amperes	FFC-10-000	.21
F2	Fuse, 40 amperes	FFE-40-000	.25
Q5	Transistor, NPN	FBN-L109	2.75
Q6	Transistor, NPN	FBN-36485	4.13
Q10 thru Q13, Q15 thru Q18	Transistor, NPN	FBN-36972	6.50
R1	Res., ww, var., 2200 ohms ±5%, 5w	DNS-22-056	2.75
R20	Res., ww, 100 ohms ±3%, 10w	DFR-10-056	1.05
R25A, B; R26A, B; R28A, B; R29A, B	Res., ww, two section, 0.75 ohms ±5%, 8w/ section	DFN-15-056	1.50
R40	Res., comp., 470 ohms ±10%, 2w	DHB-4711	.15
T1	Transformer	ABA-EE07	101.50

MODEL LMEE-0-14

C3	Cap., elect., 2000 mf -10 +100%, 60 vdc	CBS-20-057	4.50
C8, C12	Not assigned		
C18	Cap., elect., 14,000 mf -10 +100%, 35 vdc	CBT-14-012	12.28

UNIQUE PARTS (Cont)

MODEL LMEE-0-14 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
C19	Same as C18		
CR18	Rectifier	FBL-00-030	$ 1.40
CR19	Same as CR18		
F1	Fuse, "SLO-BLO", 7 amperes	FFC-07-000	.21
F2	Fuse, 20 amperes	FFE-20-000	.25
Q5	Transistor, NPN	FBN-L109	2.75
Q6	Transistor, NPN	FBN-36485	4.13
Q10 thru Q13, Q15 thru Q18	Transistor, NPN	FBN-36972	6.50
Q28	Transistor, NPN	FBL-L148	2.75
R1	Res., ww, var., 3300 ohms ±5%, 5w	DNS-33-057	3.00
R20	Not assigned		
R25A, B; R26A, B; R28A, B; R29A, B	Res., ww, two section, 1.5 ohms ±5%, 8w/ section	DFN-15-056	1.50
R43	Res., comp., 1000 ohms ±10%, 1/2w	DEB-1021	.12
R44	Res., comp., 2200 ohms ±10%, 1/2w	DEB-2221	.12
R45	Res., ww, 650 ohms ±3%, 3w	DFR-65-062	1.00
R46	Res., comp., 39 ohms ±10%, 1/2w	DEB-3901	.100
T1	Transformer	ABA-EE014	101.50

MODEL LMEE-0-32

C3	Caps., elect., 2000 mf -10 +100%, 60 vdc	CBS-20-057	4.50
C8, C12	Not assigned		
C18	Cap., elect., 7800 mf -10 +100%, 60 vdc	CBS-78-045	8.18
CR18	Rectifier	FBL-00-030	1.40
CR19	Same as CR18		
F1	Fuse, "SLO-BLO", 6.25 amperes	FFC-06-250	.21
F2	Fuse, 10 amperes	FFE-10-000	.25
Q5	Transistor, NPN	FBN-L109	2.75
Q6	Transistor, NPN	FBN-36220	4.13

UNIQUE PARTS (Cont)

MODEL LMEE-0-32 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
Q10 thru Q13, Q15 thru Q18	Transistor, NPN	FBN-38022	$ 7.00
Q28	Transistor, NPN	FBN-L148	2.75
R1	Res., ww, var., 9000 ohms ±5%, 5w	DNS-90-058	3.00
R20	Not assigned		
R25A, B; R26A, B; R28A, B; R29A, B	Res., ww, two section, 3.0 ohms ±5%, 8w/section	DFN-60-073	1.50
R43	Res., comp., 1000 ohms ±10%, 1/2w	DEB-1021	.12
R44	Res., comp., 4700 ohms ±10%, 2w	DHB-4721	.15
R45	Res., ww, 1500 ohms ±3%, 3w	DFS-15-045	.70
R46	Res, Comp, 39 ohms, ±10%, 1/2w	DEB-3901	.10
T1	Transformer	ABA-EE032	101.50

MODEL LMEE-0-60

C2	Cap., mylar, 0.22 mf ±10%, 200 vdc	CGM-22-002	.33
C3	Cap., elect., 880 mf -10 +100%, 100 vdc	CBR-88-060	4.50
C8	Cap., mylar, 0.01 mf ±10%, 80 vdc	CGL-10-008	.25
C12	Cap., mylar, 0.001 mf ±10%, 200 vdc	CGK-10-004	.21
C18	Cap., elect., 3000 mf -10 +100%, 100 vdc	CBS-30-047	11.16
CR18	Rectifier	FBL-00-030	1.40
CR19	Same as CR18		
F1	Fuse, "SLO-BLO", 6.25 amperes	FFC-00-250	.21
F2	Fuse, 10 amperes	FFE-10-000	.25
Q5	Transistor, NPN	FBN-L108	2.52
Q6	Transistor, NPN	FBN-36606	5.00
Q10 thru Q13, Q15 thru Q18	Transistor, NPN	FBN-35902	9.90

UNIQUE PARTS (Cont)

MODEL LMEE-0-60 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
Q28	Same as Q5		
R1	Res., ww, var., 13,000 ohms ±5%, 5w	DNT-13-032	$ 7.00
R9	Res., comp., 150 ohms ±10%, 1/4w	DCB-1511	.12
R16	Res., comp., 3,300 ohms ±10%, 1/2w	DEB-3321	.12
R20	Not assigned		
R25A,B; R26A,B; R28A,B; R29A,B	Res., ww, two section, 3.0 ohms ±5%, 8w/section	DFN-60-073	1.50
R43	Res., comp., 1000 ohms ±10%, 1/2w	DEB-1021	.12
R44	Res., ww, 4500 ohms ±3%, 3w	DFS-45-044	.87
R45	Res., ww, 4000 ohms ±3%, 3w	DFS-40-017	.93
R46	Res., comp., 39 ohms ±10%, 1/2w	DEB-3901	.10
T1	Transformer	ABA-EE060	101.50

PARTS FOR "OV" OPTION

MODELS LMOV-7,-8,-9

COMMON PARTS

R11	Res., ww, 1.0 ohms ±3%, 3w	DFN-10-041	.67
R12	Res., comp., 3.3 ohms ±10%, 1/2w	DEB-33G1	.12
SCR2	Rectifier, silicon controlled	FBP-00-010	12.50

UNIQUE PARTS

MODEL LMOV-7

LMOV-J	Overvoltage Module Subassembly (See separate electrical parts list LMOV-J for components located on this subassembly).

MODEL LMOV-8

LMOV-K	Overvoltage Module Subassembly (See separate electrical parts list LMOV-K for components located on this subassembly).

PARTS FOR "OV" OPTION (Cont)

MODEL LMOV-9

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
LMOV-L	Overvoltage Module Subassembly (See separate electrical parts list LMOV-L for components located on this subassembly.		

COMMON PARTS

MODELS LMOV-J,-K,-L

C1	Cap., mylar, 0.01 mf ±20%, 80 vdc	CGL-10-008	$ .50
Q1	Transistor, NPN	FBN-L102	2.40
R3	Res., film 200 ohms ±5%, 1/2w	DCR-20-010	.20
R4	Res., (thermistor) 425 ohms ±5%, 1-1/4w	DKR-43-004	1.52
R5	Res., comp., 1200 ohms ±10%, 1/2w	DEB-1221	.12
R6	Same as R5		
R8	Res., comp., 15,000 ohms ±10%, 1/2w	DEB-1531	.12
R10	Same as R5		
SCR1	Rectifier, silicon controlled	FBP-00-009	6.00

UNIQUE PARTS

MODEL LMOV-J

Q2	Transistor, PNP	FBN-L103	1.50
R1	Res., var., ww 2000 ohms ±2%, 1/2w	DNS-20-034	3.00
R2	Res., film, 560 ohms ±2%, 1/2w	DCR-56-002	.65
R7	Res., comp., 33 ohms ±5%, 1/4w	DCB-3305	.15
R9	Not assigned		

MODEL LMOV-K

Q2	Transistor, PNP	FBN-L103	1.50
R1	Res., var., ww, 5000 ohms ±10%, 1w	DNS-50-036	3.15
R2	Res., film 1470 ±1%, 1/2w	DCS-15-031	.30
R7	Res., comp., 33 ohms ±5%, 1/4w	DCB-3305	.15
R9	Not assigned		

UNIQUE PARTS (Cont)

MODEL LMOV-L

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
Q2	Transistor, PNP	FBN-L114	$ 3.50
R1	Res., var., ww, 20,000 ohms ±10%, 1w	DNT-20-010	2.85
R2	Res., film, 4700 ohms ±2%, 1/2w	DCS-47-028	.30
R7	Res., comp., 39 ohms ±5%, 1/4w	DCB-3905	.15
R9	Res., comp., 22 ohms ±10%, 1/2w	DEB-2201	.12
	MODELS LHOV-4, -5, -6 COMMON PARTS		
C1	Cap., mylar, 0.01 mf ±20%, 80 vdc	CGL-10-008	.50
Q1	Transistor, NPN	FBN-L102	2.40
Q2	Transister, PNP	FBN-L114	3.50
R2	Res., film, 560 ohms ±2%, ½w	DCR-56-002	.65
R3	Res., film, 200 ohms ±5%, ½w	DCR-20-010	.20
R4	Res., thermistor, 425 ohms ±5%, 1¼w	DKR-43-004	1.52
R5, R6	Res., comp., 1,200 ohms ±10%, ½w	DEB-1221	.12
R7	Res., comp., 33 ohms ±5%, ¼w	DCB-3305	.15
R8	Res., comp., 15,000 ohms +10%, ½w	DEB-1531	.12
R9	Res., comp., 22 ohms +10%, ½w	DEB-2201	.12
R10	Same as R5		
SCR1	Rectifier, silicon controlled	FBP-00-009	6.00
	UNIQUE PARTS MODEL LHOV-4		
R1	Res., var., ww, 10,000 ohms +10%, 1 w	DNT-10-045	3.75
	MODEL LHOV-5		
R1	Res., var., ww, 20,000 ohms +10%, 1 w	DNT-20-010	2.85
	MODEL LHOV-6		
R1	Res., var., ww, 30,000 ohms +10%, 0.6 w	DNT-30-027	9.90

PARTS FOR "MP" OPTION

MODELS MP-50, P-50

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
C1	Cap., tant., 2.5mf -15% +75%, 100 vdc	CBN-25-010	$ 1.80
DS1	Lamp assembly	HRD-00-007	.83
F1	Fuse, "SLO-BLO", 10 amps, LMEE-3 thru LMEE-5, LMEE-0-7	FFC-10-000	.21
F1	Fuse, "SLO-BLO", 15 amps, LMEE-6 thru LMEE-48 and LMEE-100 thru LMEE-150	FFC-15-000	.18
F1	Fuse, "SLO-BLO", 7 amps, LMEE-0-14 and LMEE-0-32	FFC-07-000	.21
F1	Fuse, "SLO-BLO", 6.25 amps, LMEE-0-60	FFC-06-250	.21
M1*	Meter, volts, 0-5 vdc, LMEE-3 thru LMEE-4P5	EBN-50-003	14.50
M1*	Meter, volts, 0-8 vdc, LMEE-5 and LMEE-6	EBN-80-005	12.00
M1*	Meter, volts, 0-10 vdc, LMEE-8 and LMEE-0-7	EBP-10-016	18.00
M1*	Meter, volts, 0-15 vdc, LMEE-10 thru LMEE-12, LMEE-0-14	EBP-15-017	18.00
M1*	Meter, volts, 0-20 vdc, LMEE-15 and LMEE-18	EBP-20-014	18.00
M1*	Meter, volts, 0-25 vdc, LMEE-20	EBP-25-018	18.00
M1*	Meter, volts, 0-40 vdc, LMEE-24 thru LMEE-36, LMEE-0-32	EBP-40-013	18.00
M1*	Meter, volts, 0-60 vdc, LMEE-48 and LMEE-0-60	EBP-60-015	18.00
M1*	Meter, volts, 0-120 vdc, LMEE-100	EBR-12-075	18.00
M1*	Meter, volts, 0-150 vdc, LMEE-120	EBR-15-076	18.00

PARTS FOR "MP" OPTION (Cont)

MODELS MP-50, P-50 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
M1*	Meter, volts, 0-200 vdc, LMEE-150	EBR-20-077	$ 18.00
M2*	Meter, amps, 0-50 amps, LMEE-3 thru LMEE-5	EDP-50-017	18.00
M2*	Meter, amps, 0-30 amps, LMEE-6 thru LMEE-12	EDP-30-016	18.00
M2*	Meter, amps, 0-20 amps, LMEE-15 thru LMEE-20, LMEE-0-7	EDP-20-015	18.00
M2*	Meter, amps, 0-15 amps, LMEE-24 thru LMEE-36, LMEE-0-14	EDP-15-014	18.00
M2*	Meter, amps, 0-10 amps, LMEE-48	EDP-10-013	18.00
M2*	Meter, amps, 0-5 amps, LMEE-100	EDN-50-021	18.00
M2*	Meter, amps, 0-3 amps, LMEE-120, LMEE-150 and LMEE-0-60	EDN-30-019	18.00
M2*	Meter, amps, 0-6 amps, LMEE-0-32	EDN-60-018	18.00
R1	Res, ww, var., 300 ohms ±5%, 5w, LMEE-3	DNR-3Q-018	1.95
R1	Res., ww, var., 600 ohms ±5%, 5w, LMEE-3P6 thru LMEE-6	DNR-60-026	2.75
R1	Res., ww, var., 1000 ohms ±5%, 5w, LMEE-8	DNS-10-032	1.95
R1	Res., ww, var., 2200 ohms ±5%, 5w, LMEE-10 thru LMEE-28, LMEE-0-7	DNS-22-053	2.75
R1	Res., ww, var., 3300 ohms ±5%, 5w, LMEE-36, LMEE-48 and LMEE-0-14	DNS-33-054	3.00

PARTS FOR "MP" OPTION (Cont)

MODELS MP-50, P-50 (Cont)

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
R1	Res., ww, var., 9000 ohms ±5%, 5w, LMEE-100 thru LMEE-150, LMEE-0-32	DNS-90-051	$ 3.00
R1	Res., ww, var., 13,000 ohms ±5%, 5w, LMEE-0-60	DNT-13-031	7.00
R51*	Res., meter shunt, 50 amps, LMEE-3 thru LMEE-5	ESP-50-002	2.50
R51*	Res., meter shunt, 30 amps, LMEE-6 thru LMEE-12	ESP-30-001	2.50
S1	Switch, SPST	FDA-11-040	2.22

*This part only used on MP-50

PARTS FOR "V" OPTION

The following parts change and a series resistor is added to DS1 of MP option.

C1	Cap., paper 0.01 mf ±10% 1000 vdc	CAL-10-021	1.77
RES (DS1)	120K ±10%, 1/2w	DEB-1241	.12
T1	Transformer	Add suffix "G"* to reg. T1 no.	Same as reg. T1

*Suffix "V" on units with serial no. prefix A

On the following models F1 has a different value:

MODELS LMEE-3 — LMEE-4

F1	Fuse "SLO-BLO" 5 amps	FFG-05-000	.25

MODELS LMEE-4P5 — LMEE-24, LMEE-36, LMEE-48, LMEE-100 — LMEE-150

F1	Fuse, "SLO-BLO" 7 amps	FFG-07-000	.25

MODELS LMEE-0-7 — LMEE-0-60

F1	Fuse "SLO-BLO" 4 amps	FFG-04-000	.25

MODEL LMEE-28

F1	Fuse, "SLO-BLO" 10 amps	FFG-10-000	.25

PARTS FOR "R" OPTION

Variable resistor R1 and transformer T1 change on all "EE" package models with suffix "R". Part no. changes for R1 are listed here. For transformer T1 used on these models see standard "EE" model parts lists for the standard transformer part no. and add suffix "R" to the part no. Price for T1 does not change.

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
	MODEL LMEE-3		
R1	Res., var., ww, 300 ohms ±5%, 5w	DNR-30-029	$ 3.45
	MODELS LMEE-3P6 — LMEE-6		
R1	Res., var., ww 600 ohms ±5%, 5w	DNR-60-030	5.40
	MODEL LMEE-8		
R1	Res., var., ww, 1000 ohms ±5%, 5w	DNS-10-064	3.90
	MODELS LMEE-10 — LMEE-28 LMEE-0-7		
R1	Res., var., ww, 2200 ohms ±5%, 5w	DNS-22-065	3.90
	MODELS LMEE-36, LMEE-48, LMEE-0-14		
R1	Res., var., ww, 3300 ohms ±5%, 5w	DNS-33-066	5.40
	MODELS LMEE-100 LMEE-150, LMEE-0-32		
R1	Res., var., ww, 9000 ohms ±5%, 5w	DNS-90-068	6.25
	MODEL LMEE-0-60		
R1	Res., var., ww, 13,000 ohms ±5%, 5w	DNT-13-036	5.40

PARTS FOR "Y" OPTION

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.	UNIT PRICE
C107	Cap., elect., 40 mfd, 35 vdc	CBP-40-014	$ 1.68
CR1	Rect., zener diode	FBM-Z107	3.75
CR101	Rect., zener diode	FBM-Z104	4.35
Q101	Transistor NPN	FBN-L-109	2.75
R4	Res., comp., 220,000 ohms ±10%, 1/2w	DEB-2241	.12
R101	Res., film, 6,800 ohms ±2%, 1/4w	DCS-68-032	.30
R102	Res., film, 220 ohms ±2%, 1/4w	DCR-22-014	.30

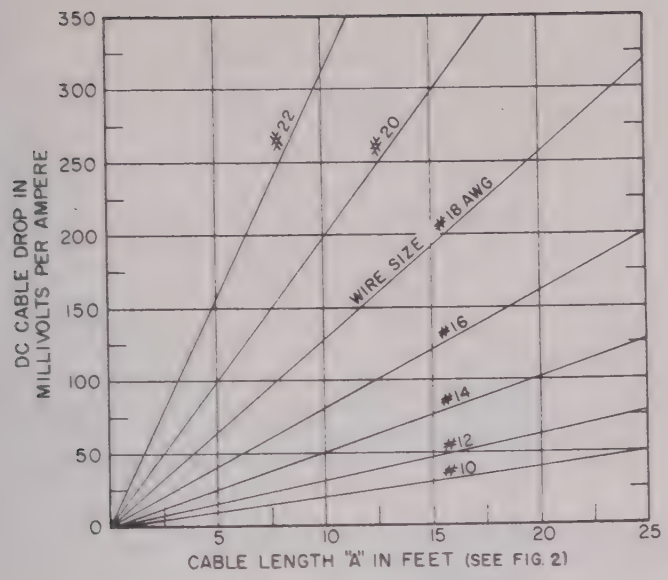


Figure 1. Cable Connection Chart

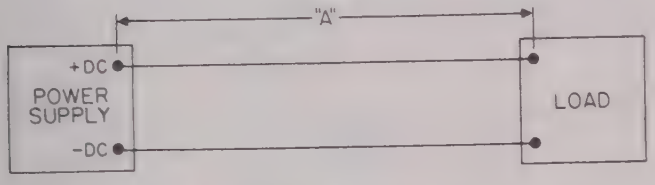
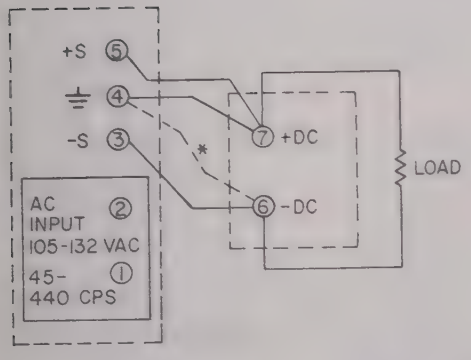
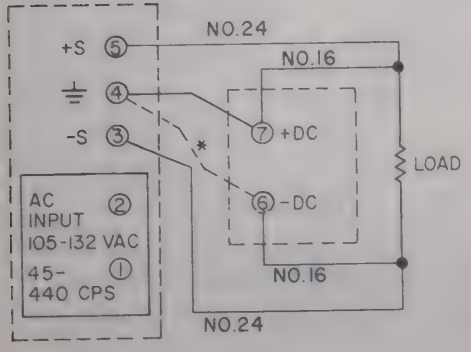


Figure 2. Cable Length "A" in Feet



NOTE:
* FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS 4 AND 7 AND RECONNECT TO TERMINALS 4 AND 6.

Figure 3. Local Sensing Connections



NOTE:
* FOR NEGATIVE GROUND DISCONNECT JUMPER FROM TERMINALS 4 AND 7 AND RECONNECT TO TERMINALS 4 AND 6.

Figure 4. Remote Sensing Connections

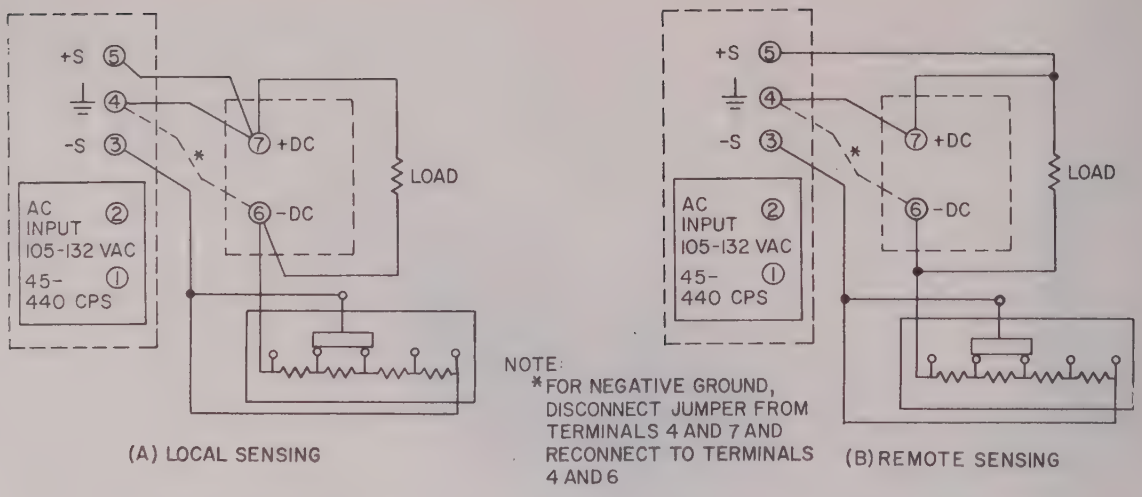


Figure 5. Programmed Voltage, with External Resistor

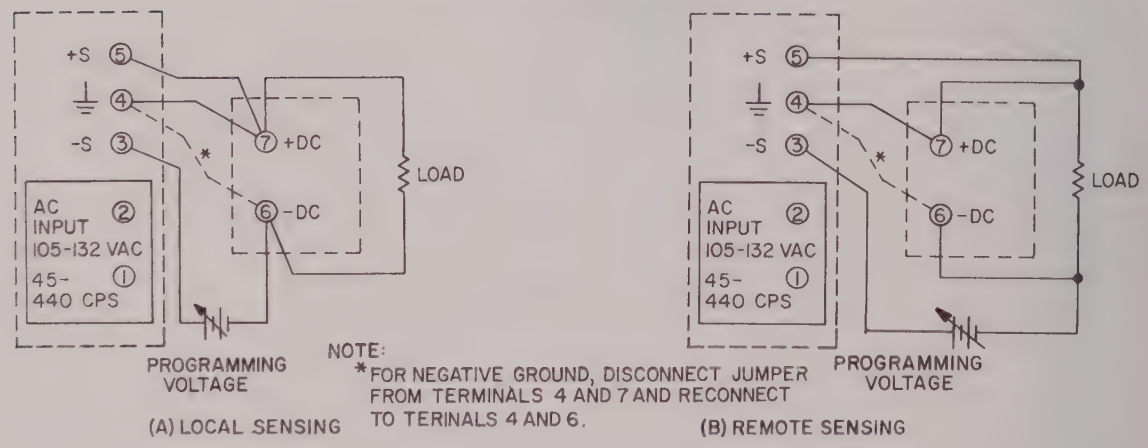


Figure 6. Programmed Voltage, with External Programming Voltage Source

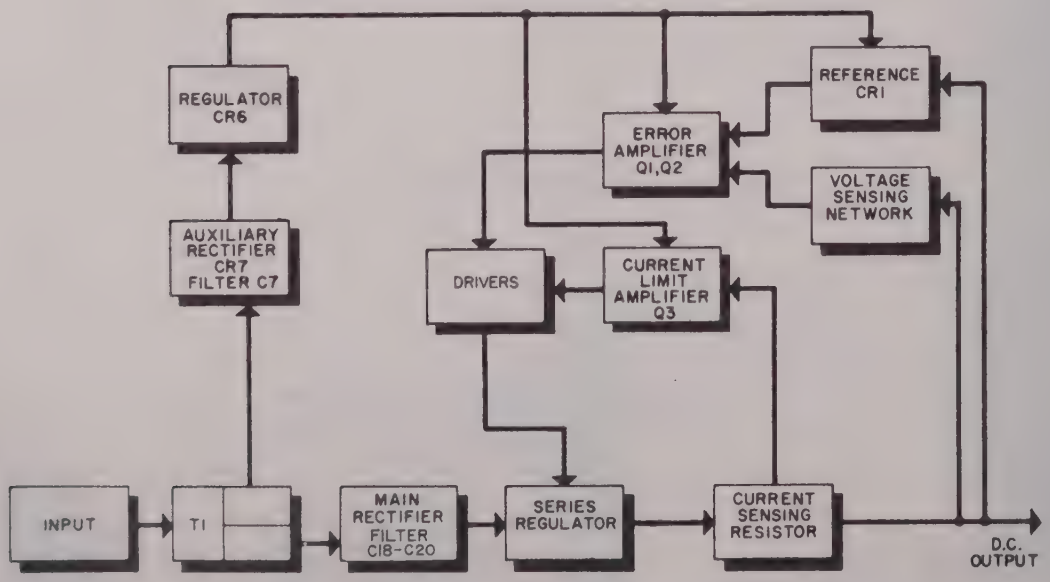


Figure 7. Typical Block Diagram

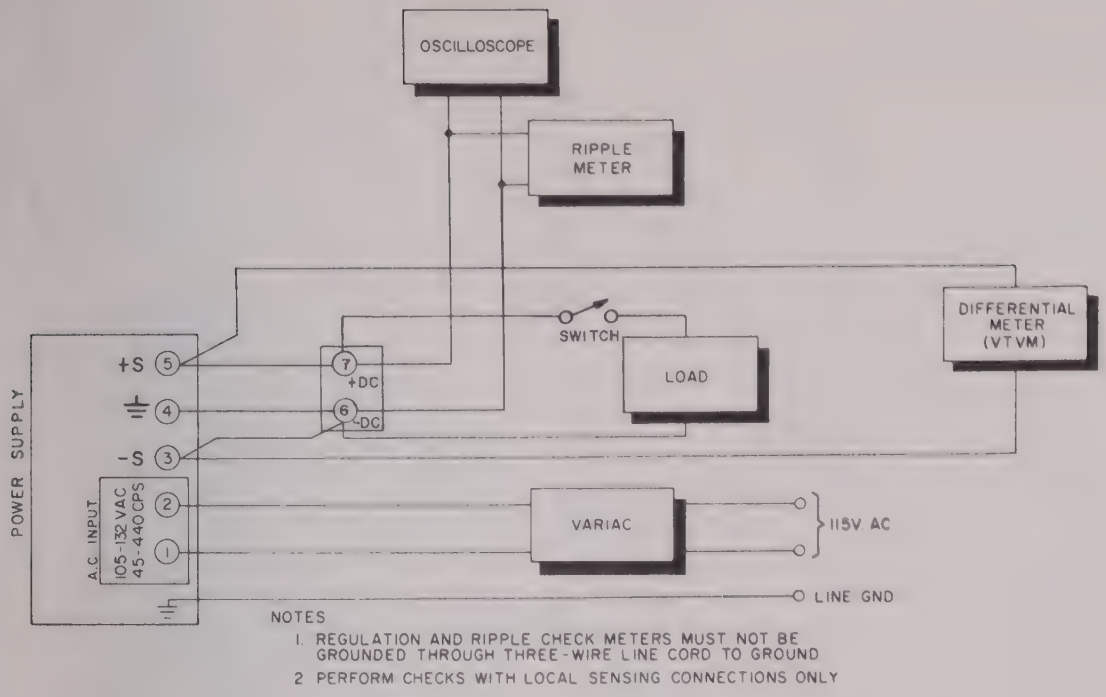


Figure 8. Test Connections for Performance Checks

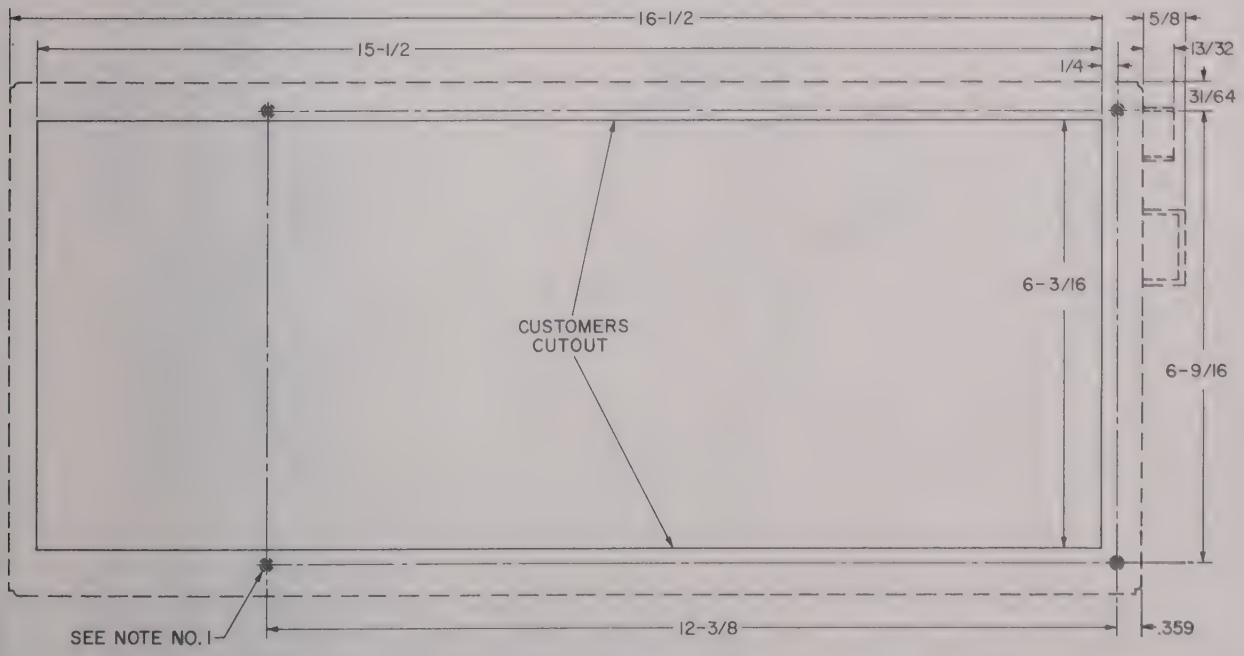
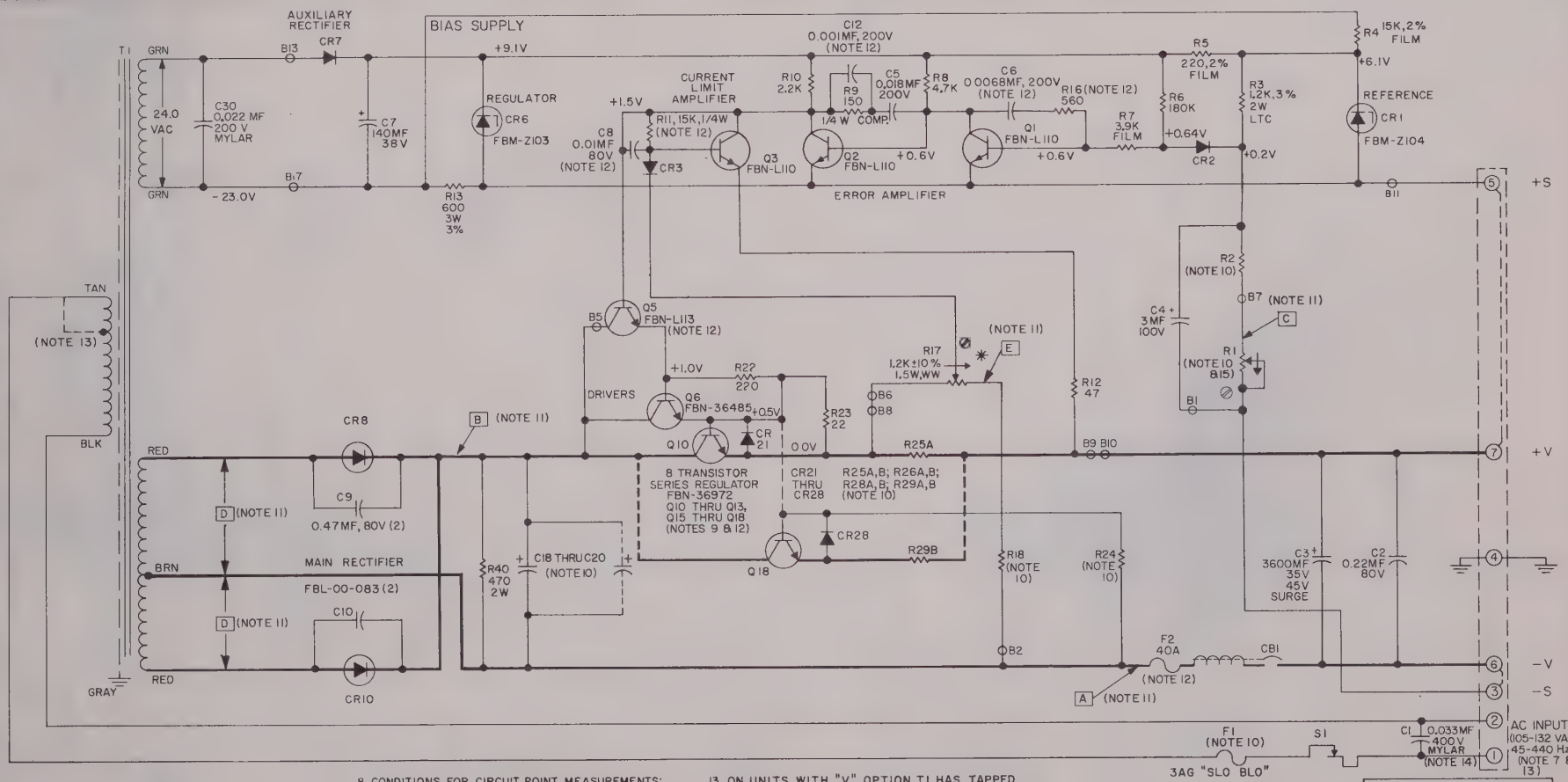

16-1/2
15-1/2
5/8
13/32
1/4
31/64
6-3/16
6-9/16
CUSTOMERS CUTOUT
SEE NOTE NO. 1
12-3/8
.359
NOTES:
1. NO. 8-32 TAPPED HOLES (4) ON BOTTOM SURFACE FOR CUSTOMER CHASSIS MOUNTING. RECOMMENDED LENGTH OF ALL NO. 8-32 MOUNTING SCREWS IS 3/8 INCH PLUS THICKNESS OF MOUNTING SURFACE.
2. USE NO. 7 (0.201 DIA.) DRILL FOR DRILLING MOUNTING HOLES IN MOUNTING SURFACE.
3. DOTTED OUTLINE SHOWS UNIT AS SEEN THROUGH MOUNTING SURFACE.
BOTTOM VIEW

Figure 9. Recommended Mounting Cutout



NOTES

1. RESISTOR VALUES ARE IN OHMS.
2. RESISTOR WATTAGE 1/2 WATT; RESISTORS ABOVE 2 WATTS ARE WIREWOUND UNLESS OTHERWISE NOTED.
3. RESISTOR TOLERANCES: COMP. ±10%; WIREWOUND ±5%; FILM ±5%; UNLESS OTHERWISE NOTED.
4. CAPACITOR TOLERANCES: ELECTROLYTIC -10%,+100%; MYLAR ±10%; UNLESS OTHERWISE NOTED.
5. SYMBOLS:
   - INDICATES CLOCKWISE ROTATION OF SHAFT.
   - INDICATES ADJUSTMENT OR CALIBRATION CONTROL.
   - INDICATES CONNECTION TO CHASSIS.
   - INDICATES ACTUAL UNIT MARKING
   - SEE INSTRUCTION MANUAL.
   - LAMBDA PT. #FBL-00-030; USE IN4002 DIODE FOR REPLACEMENT UNLESS OTHERWISE NOTED.
   - INDICATES TERMINAL ON PRINTED WIRING BOARD OR TERMINAL BOARD
6. DESIGNATIONS ARE LAMBDA PART NUMBERS.
7. DELETE 40°C RATING FOR 45-55Hz, FOR 360-440Hz, CONSULT FACTORY.
8. CONDITIONS FOR CIRCUIT POINT MEASUREMENTS: INPUT: 115 VAC, 60Hz ; OUTPUT: NOML VDC NO LOAD. INDICATED VOLTAGES ARE TYPICAL VALUES AND ARE DC UNLESS OTHERWISE NOTED. DC MEASUREMENTS TAKEN WITH 20,000 OHMS/V VOLTMETER BETWEEN +S (TERM. 5) & INDICATED POINTS UNLESS NOTED.
9. COAT BOTH SIDES OF INSULATING WAFER WITH DOW CORNING NO. 340 SILICONE GREASE.
10. SEE TABLE I FOR COMPONENT VALUES.
11. SEE TABLE I FOR VOLTAGE VALUES.
12. ON MODEL LMEE-12, Q5 IS FBN-L109, Q10 THRU Q13 & Q15 THRU Q18 IS FBN-36220, C6 IS 0.018MF, R11 IS 22K AND R16 IS 330 C8 AND CB1 NOT USED; C12 AND F2 USED ONLY ON THIS MODEL.
13. ON UNITS WITH "V" OPTION, T1 HAS TAPPED PRIMARY. "V" OPTION UNITS CAN BE WIRED FOR 187-242V INPUT (USING TAP) OR FOR 205-265V INPUT (USING ENTIRE PRIMARY). ON SERIAL NO. PREFIX A, "V" OPTION UNITS; T1 PRIMARY IS NOT TAPPED. AC INPUT IS 205-265V.
14. ON UNITS WITH "V" OPTION, C1 IS 0.01MF±10%, 1000V PAPER.
15. ON UNIT WITH "S" OPTION, R2 IS REPLACED BY A JUMPER.

REF. DES. NOT USED		
Q4	CR9	
Q7, Q14	CR4,5	R14,15
C11-C17		R19-21
C8		R30-39
		R27

MODELS
LMEE-3
LMEE-3P6
LMEE-4
LMEE-4P5
LMEE-5
LMEE-6
LMEE-8
LMEE-10
LMEE-12

FOR WIRING OF POWER SUPPLY TO LOAD REFER TO SUPPLY-TO-LOAD WIRING DIAGRAMS.

DOTTED CONNECTIONS SHOWN ON TB1 INDICATE JUMPERS IN PLACE FOR LOCAL SENSING CONNECTION.

THIS SCHEMATIC APPLIES TO UNITS BEARING SERIAL NO. PREFIXES A&B

SCHEMATIC DIAGRAM
REGULATED POWER SUPPLY

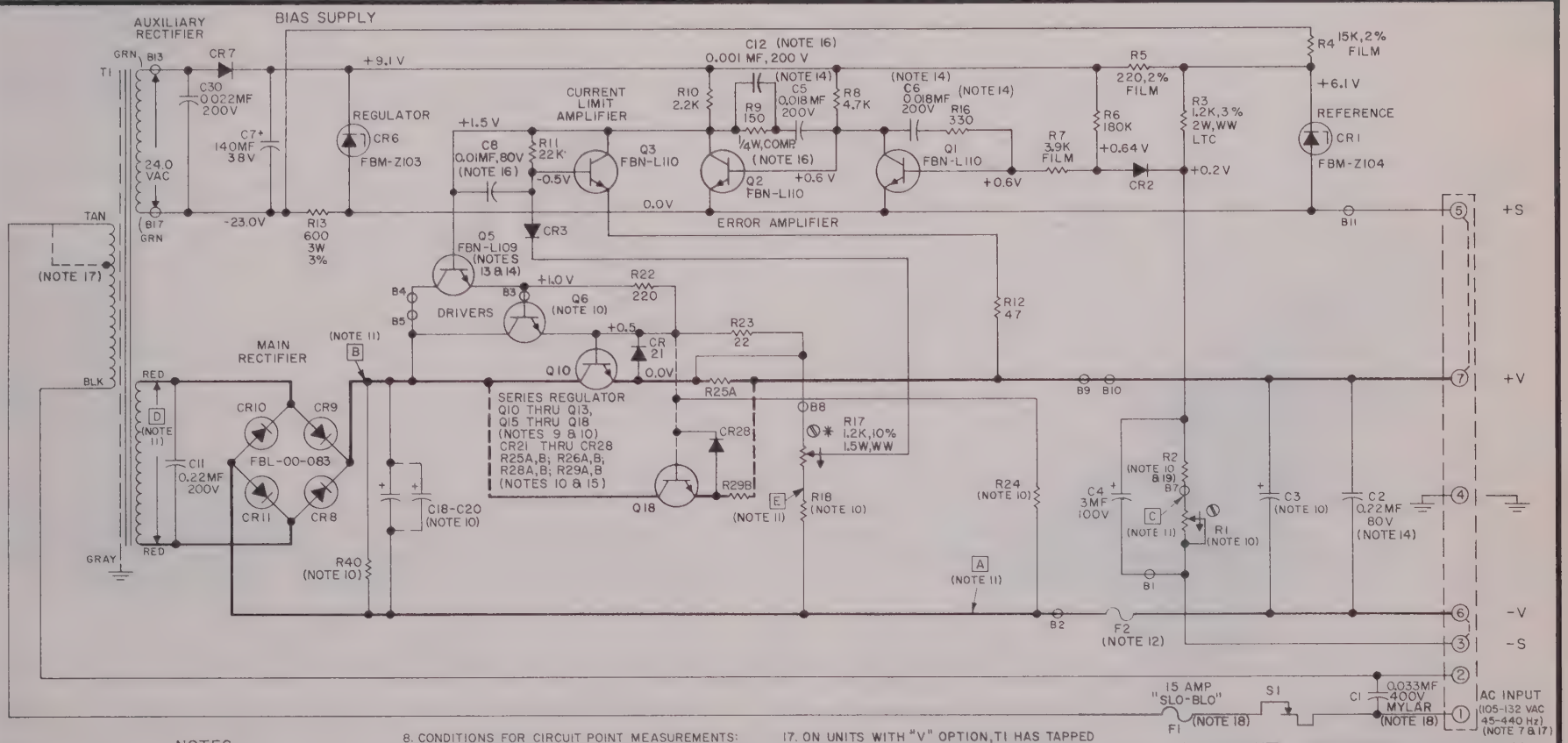
LAMBDA ELECTRONICS CORP.
MELVILLE NEW YORK
A VECO SUBSIDIARY

TABLE 1

DATA REFERENCES FOR MODELS LMEE-3 — LMEE-12

Model	Voltage Range (VDC)	Max. Current (Amps)				Schematic Voltage Measurement					Schematic Components						
												R1	R2	R18	R24	R25A, R26A, R28A R29A, R25B, R26B R28B, R29B	F1*
		40°C	50°C	60°C	71°C	A (VDC)	B (VDC)	C (VDC)	D (VAC)	E (VDC)	C18-C20	±5% 5W	±3% 2W	±5% 1/2W	±10% 2W		3AG (AMPS)
LMEE-3	3±5%	33.0	29.0	25.0	20.5	-3.0	+7.8	-2.1	8.1	3.0	25,000 MF, 20V, 30V SURGE	300	430	JUMPER	68	0.18±5%, 11W	10 (5, 3AB)
LMEE-3P6	3.6±5%	32.0	26.0	22.0	18.3	-3.6	+8.5	-2.1	9.0	3.6	25,000 MF, 20V, 30V SURGE	600	430	JUMPER	68	0.18±5%, 11W	10 (5, 3AB)
LMEE-4	4±5%	32.0	26.0	22.0	18.3	-4.0	+8.1	-3.0	9.0	4.0	25,000 MF, 20V, 30V SURGE	600	600	JUMPER	68	0.18±5%, 11W	10 (5, 3AB)
LMEE-4P5	4.5±5%	31.0	24.6	20.8	17.3	-4.5	+8.9	-3.2	9.9	-3.4	25,000 MF, 20V, 30V SURGE	600	650	390	180	0.18±5%, 11W	10 (7, 3AB)
LMEE-5	5±5%	31.0	24.6	20.8	17.3	-5.0	+8.4	-3.2	9.9	-2.4	25,000 MF, 20V, 30V SURGE	600	650	1300	180	0.18±5%, 11W	10 (7, 3AB)
LMEE-6	6±5%	30.0	24.6	20.8	17.3	-6.0	+8.6	-4.0	10.8	-2.9	25,000 MF, 20V, 30V SURGE	600	800 2W	1300	180	0.18±5%, 11W	15 (7, 3AB)
LMEE-8	8±5%	28.0	23.5	19.7	16.5	-8.0	+9.1	-6.0	12.6	-2.7	25,000 MF, 20V, 30V SURGE	1000	1200 2W	2400	180	0.18±5%, 11W	15 (7, 3AB)
LMEE-10	10±5%	24.0	20.4	16.8	13.8	-10.0	+11.0	-6.0	15.3	-3.3	14,000 MF, 35V, 60V SURGE	2200	1200 2W	2400	180	0.30±5%, 11W	15 (7, 3AB)
LMEE-12	12±5%	21.0	19.0	16.1	13.2	-12.0	+11.6	-9.0	17.1	-4.0	14,000 MF, 35V, 60V SURGE	2200	1800	2400	470	0.47±5%, 8W	15 (7, 3AB)

* Fuse ratings in parenthesis apply to units with "V" option.



NOTES

1. RESISTOR VALUES ARE IN OHMS.
2. RESISTOR WATTAGE 1/2 WATT; RESISTORS ABOVE 2 WATTS ARE WIREWOUND UNLESS OTHERWISE NOTED.
3. RESISTOR TOLERANCES: COMP. ±10%; WIREWOUND ±5%; FILM ±5%; UNLESS OTHERWISE NOTED.
4. CAPACITOR TOLERANCES: ELECTROLYTIC -10%,+100%; MYLAR ±10%; UNLESS OTHERWISE NOTED.
5. SYMBOLS:
   - INDICATES CLOCKWISE ROTATION OF SHAFT.
   - INDICATES ADJUSTMENT OR CALIBRATION CONTROL.
   - INDICATES CONNECTION TO CHASSIS.
   - INDICATES ACTUAL UNIT MARKING
   - SEE INSTRUCTION MANUAL.
   - LAMBDA PT. #FBL-00-030; USE IN4002 DIODE FOR REPLACEMENT UNLESS OTHERWISE NOTED.
   - INDICATES TERMINAL ON PRINTED WIRING BOARD "B".
6. DESIGNATIONS ARE LAMBDA PART NUMBERS.
7. DELETE 40°C RATING FOR 45-55Hz, FOR 360-440 Hz, CONSULT FACTORY.
8. CONDITIONS FOR CIRCUIT POINT MEASUREMENTS: INPUT: 115VAC, 60 Hz ; OUTPUT: NOM'L VDC, NO LOAD INDICATED VOLTAGES ARE TYPICAL VALUES AND ARE DC UNLESS OTHERWISE NOTED. DC MEASUREMENTS TAKEN WITH 20,000 OHMS/V VOLTMETER BETWEEN +S (TERM. 5) & INDICATED POINTS UNLESS NOTED.
9. COAT BOTH SIDES OF INSULATING WAFER WITH DOW CORNING NO. 340 SILICONE GREASE.
10. SEE TABLE I FOR COMPONENT VALUES
11. SEE TABLE I FOR VOLTAGE VALUES
12. SEE TABLE I FOR FUSE RATING.
13. IF Q5 IS REPLACED, ALWAYS RETAIN RADIATOR AND INSTALL WITH NEW TRANSISTOR.
14. ON MODEL LMEE-48, Q5 IS FBN-L108, C2 IS 200V, C5 IS 0.047MF 80V, C6 IS 0.0022MF AND R16 IS 1K.
15. ON MODELS LMEE-24 THRU LMEE-48, CR21-CR28 NOT USED.
16. ON MODELS LMEE-24 & LMEE-28 C12 IS 240pf, 1KV; R9 IS 27, R11 IS 15K, C8 ONLY USED ON THESE MODELS.
17. ON UNITS WITH "V" OPTION, T1 HAS TAPPED PRIMARY. "V" OPTION UNITS CAN BE WIRED FOR 187-242V INPUT (USING TAP) OR FOR 205-265V INPUT (USING ENTIRE PRIMARY). ON SERIAL NO. PREFIX A, "V" OPTION UNITS; T1 PRIMARY IS NOT TAPPED. AC INPUT IS 205-265V.
18. ON UNITS WITH "V" OPTION, C1 IS 0.01MF±10%, 1000V, PAPER; F1 IS 7A FOR MODELS LM-EE15, EE18, EE20, EE24, EE36, EE48; F1 IS 10A FOR MODEL LM-EE28.
19. ON UNITS WITH "S" OPTION, R2 IS REPLACED BY A JUMPER.

REFERENCE DESIGNATIONS NOT USED	
Q7,Q14	R14
Q4	R15
CR4	R19-R21
CR5	R27
C8-C10	
C13-C17	

MODELS
LMEE-15
LMEE-18
LMEE-20
LMEE-24
LMEE-28
LMEE-36
LMEE-48

FOR WIRING OF POWER SUPPLY TO LOAD REFER TO SUPPLY-TO-LOAD WIRING DIAGRAMS.

DOTTED CONNECTIONS SHOWN ON TBI INDICATE JUMPERS IN PLACE FOR LOCAL SENSING CONNECTION.

THIS SCHEMATIC APPLIES TO UNITS BEARING SERIAL NO. PREFIXES A&B

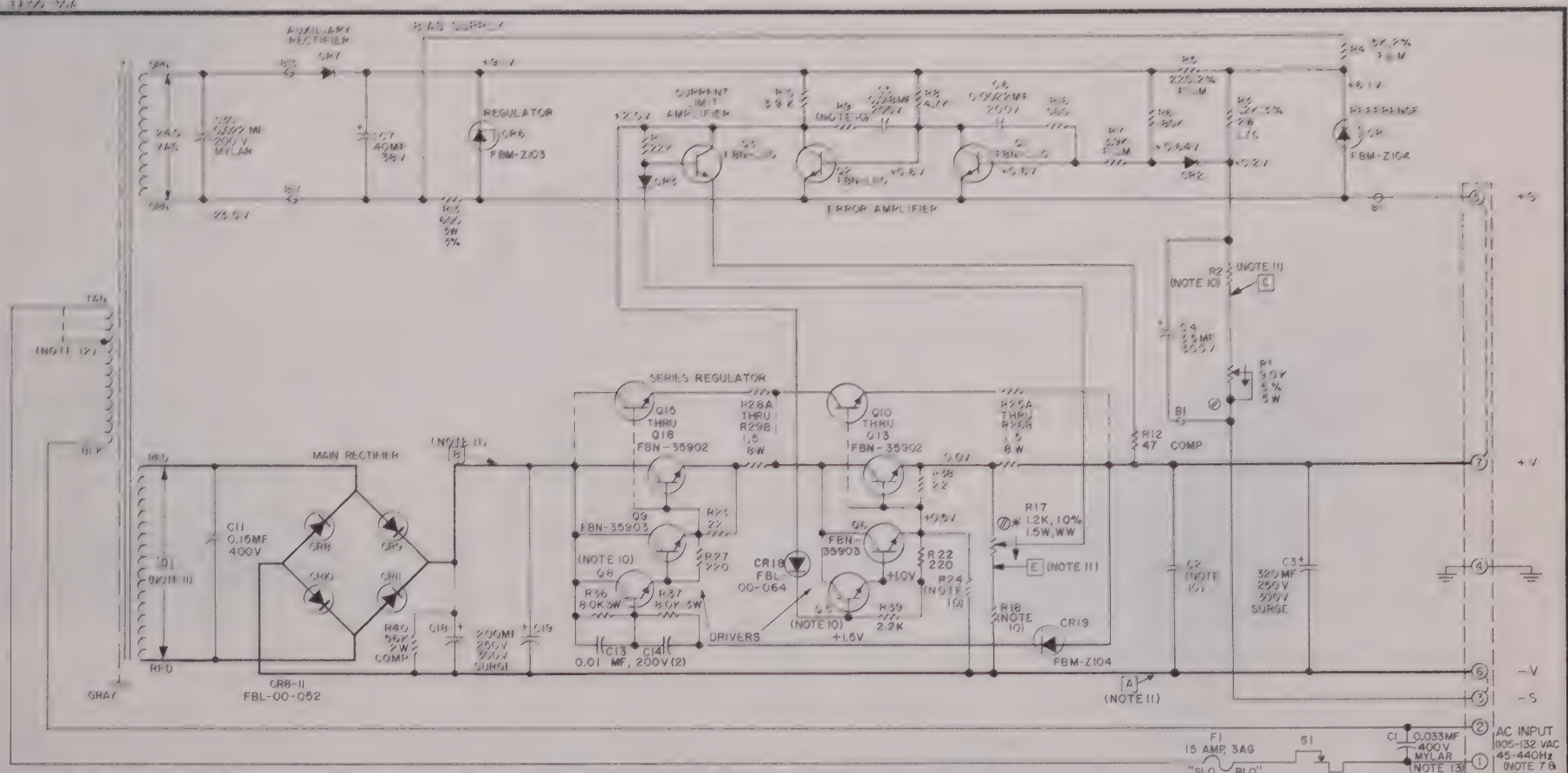
SCHEMATIC DIAGRAM
REGULATED POWER SUPPLY

LAMBDA ELECTRONICS CORP.
MELVILLE NEW YORK

TABLE 1

DATA REFERENCES FOR MODELS LMEE-15 — LMEE-48

Model	Voltage Range (VDC)	Max. Current (Amps)				Schematic Voltage Measurement					Schematic Components										
		40 °C	50 °C	60 °C	71 °C	A (VDC)	B (VDC)	C (VDC)	D (VAC)	E (VDC)	C3	C18-C20	Q10-Q13, Q15-Q18 (FBN-)	Q6 (FBN-)	R1 ±5% 5W	R2 ±3% 3W	R18 ±5% 1/2W	R24 ±10% 2W	R40 ±10% 2W	R25A, R25B, R26A, R26B, R28A, R28B, R29A, R29B	F2 4AG (Amps)
LMEE-15	15 ± 5%	19.0	18.0	15.5	12.7	-15.0	+12.2	-9.0	19.8	-5.0	3600 MF, 35V, 45V SURGE	14,000 MF, 35V, 60V SURGE	36220	36485	2200	1800	2400	470	1000	0.30 ± 5%, 11W	40
LMEE-18	18 ± 5%	16.5	14.8	12.4	10.1	-18.0	+14.4	-12.5	23.4	-2.7	3600 MF, 35V, 45V SURGE	14,000 MF, 35V, 60V SURGE	36220	36220	2200	2500	6800	680	1000	0.75 ± 5%, 8W	40
LMEE-20	20 ± 5%	15.2	13.7	11.8	9.7	-20.0	+16.0	-12.5	26.0	-3.0	2000 MF, 60V, 85V SURGE	7800 MF, 60V, 100V SURGE	36220	36220	2200	2500	6800	680	1000	0.75 ± 5%, 8W	40
LMEE-24	24 ± 5%	14.0	12.5	10.8	9.0	-24.0	+16.0	-18.0	28.8	-3.6	2000 MF, 60V, 85V SURGE	7800 MF, 60V, 100V SURGE	36220	36220	2200	3600	6800	1000	5600	0.30 ± 5%, 11W	30
LMEE-28	28 ± 5%	13.0	11.5	9.8	8.2	-28.0	+17.0	-22.5	32.4	-4.2	2000 MF, 60V, 85V SURGE	7800 MF, 60V, 100V SURGE	36220	36220	2200	4500	6800	1000	5600	0.47 ± 5%, 8W	30
LMEE-36	36 ± 5%	10.4	9.8	8.6	7.1	-36.0	+19.2	-28.0	39.6	-3.9	2000 MF, 60V, 85V SURGE	7800 MF, 60V, 100V SURGE	36220	36220	3300	5600	10,000	1500	5600	0.47 ± 5%, 8W	20
LMEE-48	48 ± 5%	7.7	7.1	6.5	5.4	-48.0	+25.0	-40.0	52.0	-5.2	880 MF 100V, 150V SURGE	3000 MF, 100V, 135V SURGE	36487	36487	3300	8000	10,000	1800	5600	0.75 ± 5%, 8W	20



NOTES

1. RESISTOR VALUES ARE IN OHMS.
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5. SYMBOLS:
   - INDICATES CLOCKWISE ROTATION OF SHAFT.
   - INDICATES ADJUSTMENT OR CALIBRATION CONTROL.
   - INDICATES CONNECTION TO CHASSIS.
   - INDICATES ACTUAL UNIT MARKING
   - SEE INSTRUCTION MANUAL.
   - LAMBDA PT. #FBL-00-030; USE IN4002 DIODE FOR REPLACEMENT UNLESS OTHERWISE NOTED.
   - INDICATES TERMINAL ON PRINTED WIRING BOARD OR TERMINAL BOARD
6. DESIGNATIONS ARE LAMBDA PART NUMBERS.
7. DELETE 40°C RATING FOR 45-55Hz, FOR 360-440 Hz, CONSULT FACTORY.
8. CONDITIONS FOR CIRCUIT POINT MEASUREMENTS: INPUT: 115 VAC, 60Hz, OUTPUT: NOML VDC NO LOAD. INDICATED VOLTAGES ARE TYPICAL VALUES AND ARE DC UNLESS OTHERWISE NOTED. DC MEASUREMENTS TAKEN WITH 20,000 OHMS/V VOLTMETER BETWEEN +S (TERM. 5) & INDICATED POINTS UNLESS NOTED.
9. COAT BOTH SIDES OF INSULATING WAFER WITH DOW CORNING NO. 340 SILICONE GREASE.
10. SEE TABLE I FOR COMPONENT VALUES.
11. SEE TABLE I FOR VOLTAGE VALUES
12. ON UNITS WITH "V" OPTION, T1 HAS TAPPED PRIMARY. "V" OPTION UNITS CAN BE WIRED FOR 187-242V INPUT (USING TAP) OR FOR 205-265V INPUT (USING ENTIRE PRIMARY). ON SERIAL NO. PREFIX A, "V" OPTION UNITS; T1 PRIMARY IS NOT TAPPED. AC INPUT IS 205-265V.
13. ON UNITS WITH "V" OPTION, C1 IS 0.01MF±10%, 1000V PAPER, F1 IS 7A, 3AB.

REF DES. NOT USED		
Q4, Q7		
Q17, Q11		R14, 15
Q14	CR4, 5	R19-21
C15-C17	CR12-17	R30-35
C8-10		
C15-C17		

MODELS
LMEE-100
LMEE-120
LMEE-150

FOR WIRING OF POWER SUPPLY TO LOAD REFER TO SUPPLY-TO-LOAD WIRING DIAGRAMS.

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THIS SCHEMATIC APPLIES TO UNITS BEARING SERIAL NO. PREFIXES A&B

SCHEMATIC DIAGRAM
REGULATED POWER SUPPLY

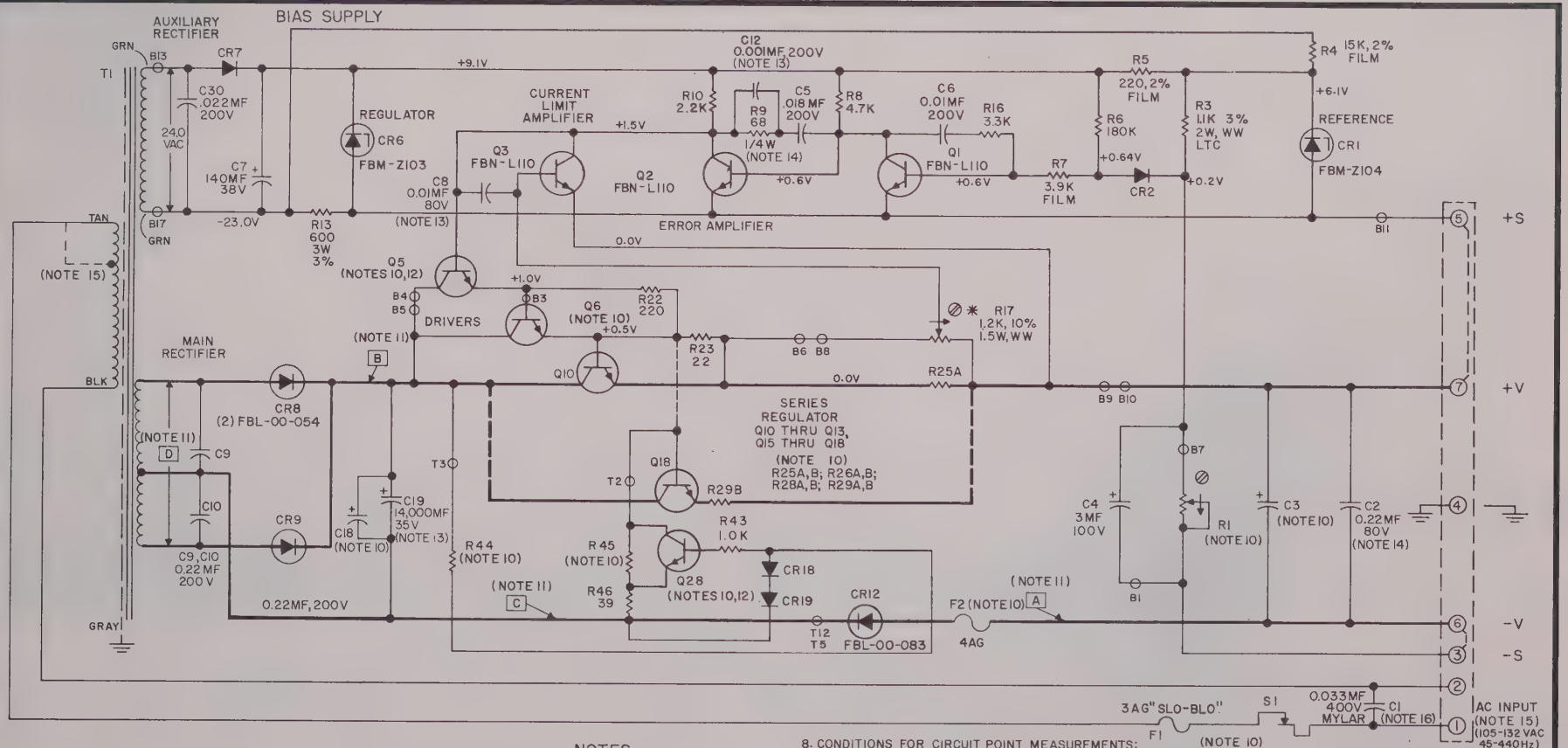
LAMBDA ELECTRONICS CORP. MELVILLE NEW YORK
A Veeco SUBSIDIARY

TABLE 1

DATA REFERENCES FOR MODELS LMEE-100, LMEE-120 AND LMEE-150

Model	Range (VDC)	Max. Current (Amperes)				Schematic Voltage Measurement					Schematic Components					
		40°C	50°C	60°C	71°C	A (VDC)	B (VDC)	C (VDC)	D (VAC)	E (VDC)	C2	Q5, Q8 (FBN-)	R2 ±3% 5W	R9 ±10% 1/4W	R18 ±5% 1/2W	R24 ±10% 2W
LMEE-100	100±5%	3.3	3.0	2.5	2.1	-100.0	+51	-80	107	-3	0.15MF ±10% 200V	L108	16,000	150	39,000	10,000
LMEE-120	120±5%	3.0	2.7	2.2	1.9	-120.0	+56	-100	126	-3	0.15MF ±10% 200V	L108	20,000	820	43,000	12,000
LMEE-150	150±5%	2.20	2.00	1.75	1.50	-150.0	+66	-130	153	-3	0.15MF ±20% 400V	L115	26,000	150	56,000	12,000

SCB-EEO-14



NOTES

1. RESISTOR VALUES ARE IN OHMS.
2. RESISTOR WATTAGE 1/2 WATT; RESISTORS ABOVE 2 WATTS ARE WIREWOUND UNLESS OTHERWISE NOTED.
3. RESISTOR TOLERANCES: COMP. ±10%; WIREWOUND ±5%; FILM ±5%; UNLESS OTHERWISE NOTED.
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   - INDICATES ACTUAL UNIT MARKING
   - SEE INSTRUCTION MANUAL.
   - LAMBDA PT. #FBL-00-030; USE IN4002 DIODE FOR REPLACEMENT UNLESS OTHERWISE NOTED.
   - INDICATES TERMINAL ON PRINTED WIRING BOARD 'B', BOARD "T".
6. DESIGNATIONS ARE LAMBDA PART NUMBERS.
7. DELETE 40°C RATING FOR 45-55Hz, FOR 360-440Hz, CONSULT FACTORY.
8. CONDITIONS FOR CIRCUIT POINT MEASUREMENTS: INPUT: 115VAC, 60Hz; OUTPUT: NOM'L VDC, NO LOAD INDICATED VOLTAGES ARE TYPICAL VALUES AND ARE DC UNLESS OTHERWISE NOTED. DC MEASUREMENTS TAKEN WITH 20,000 OHMS/V VOLTMETER BETWEEN +S (TERM. 5) & INDICATED POINTS UNLESS NOTED.
9. COAT BOTH SIDES OF INSULATING WAFER WITH DOW CORNING NO. 340 SILICONE GREASE.
10. SEE TABLE I FOR COMPONENT VALUES.
11. SEE TABLE I FOR VOLTAGE VALUES.
12. IF Q5 AND/OR Q28 IS REPLACED RETAIN RADIATOR AND INSTALL WITH NEW TRANSISTOR.
13. C19 ONLY USED ON MODEL LMEE-0-14; C8 AND C12 ONLY USED ON MODEL LMEE-0-60.
14. ON MODEL LMEE-0-60, R9 IS 150, AND C2 IS 200V.
15. ON UNITS WITH "V" OPTION, T1 HAS TAPPED PRIMARY. "V" OPTION UNITS CAN BE WIRED FOR 187-242V INPUT (USING TAP) OR FOR 205-265V INPUT (USING ENTIRE PRIMARY). ON SERIAL NO. PREFIX A, "V" OPTION UNITS; T1 PRIMARY IS NOT TAPPED. AC INPUT IS 205-265V.
16. ON UNITS WITH "V" OPTION, C1 IS 0.01MF±10%, 1000V, PAPER.

REFERENCE DESIGNATIONS NOT USED	
Q4	R15,R18
Q7	R21,R24
CR3,4,5	R31-42
CR13-17	R19,20
Q14-27	
R2,R11	
R12,R14	

MODELS
LMEE-0-14
LMEE-0-32
LMEE-0-60

FOR WIRING OF POWER SUPPLY TO LOAD REFER TO SUPPLY-TO-LOAD WIRING DIAGRAMS.

DOTTED CONNECTIONS SHOWN ON TB1 INDICATE JUMPERS IN PLACE FOR LOCAL SENSING CONNECTION.

THIS SCHEMATIC APPLIES TO UNITS BEARING SERIAL NO. PREFIXES A&B

SCHEMATIC DIAGRAM
REGULATED POWER SUPPLY

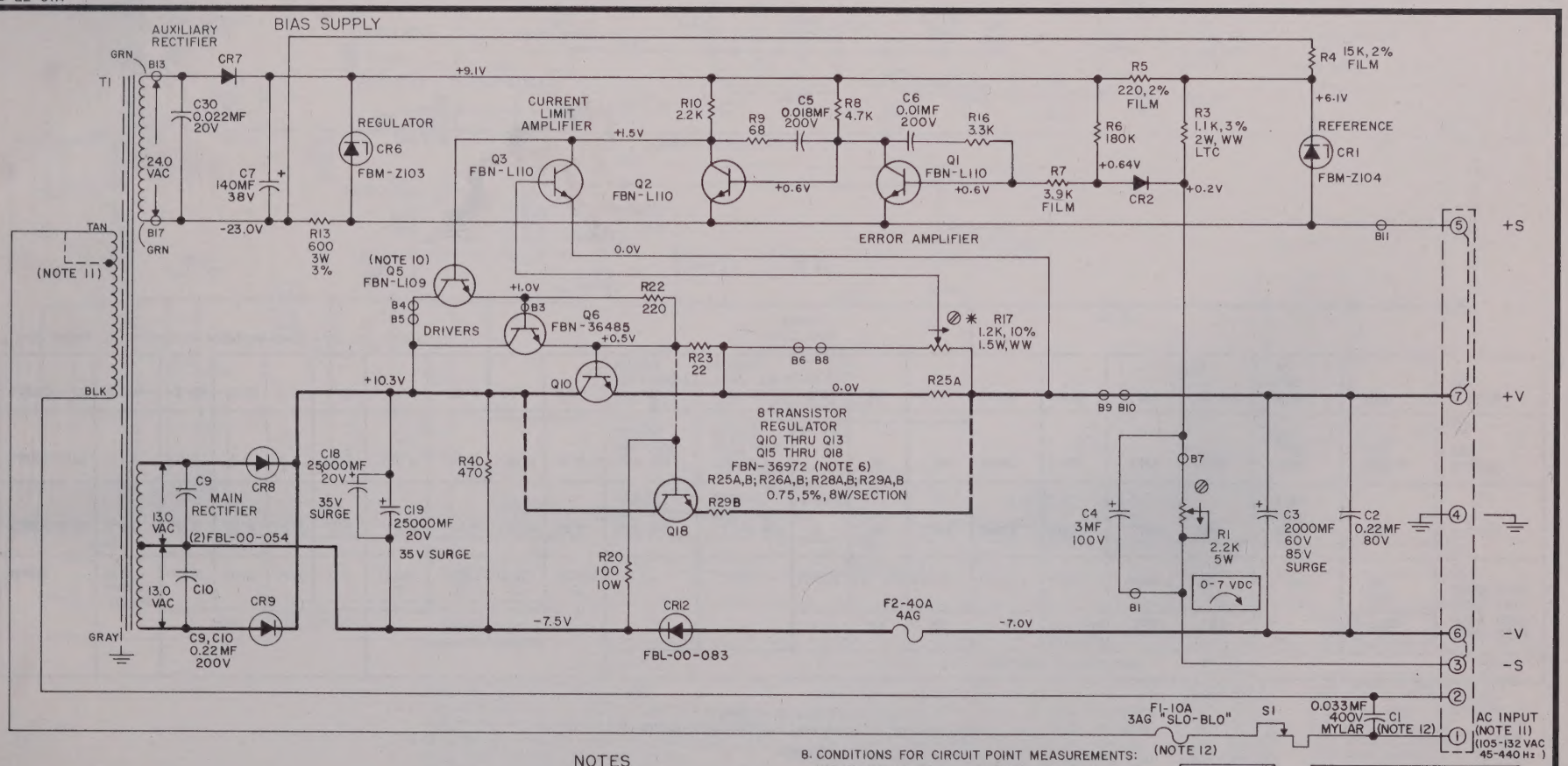
LAMBDA ELECTRONICS CORP.
MELVILLE NEW YORK
A Veeco SUBSIDIARY

TABLE 1

DATA REFERENCES FOR MODELS LMEE-0-14,
LMEE-0-32 AND LMEE-0-60

Model	Voltage Range (VDC)	Max. Current (Amps)				Schematic Voltage Measurement				Schematic Components										
		40°C	50°C	60°C	71°C	A (VDC)	B (VDC)	C (VDC)	D (VAC)	C3	C18	F1* (AMPS)	F2 (AMPS)	Q5 (FBN-)	Q6 (FBN-)	Q10-Q13 Q15-Q18 (FBN-)	Q28 (FBN-)	R1 ±5% 5W	R44	R45 ±3% 3W	R25A, R26A, R28A, R29A, R25B, R26B, R28B, R29B
LMEE-0-14	0-14	10.2	8.6	7.3	6.1	-14.0	+14.0	-14.5	20.6	2000 MF, 60V, 85V SURGE	14,000 MF, 35V, 135V SURGE	7 (4,3AB)	20	L109	36485	36972	L148	3300	2200 ±10% 1/2w	650	1.5±5% 8W
LMEE-0-32	0-32	5.2	4.4	3.8	3.2	-32.0	+19.0	-32.5	36.6	2000 MF, 60V, 85V SURGE	7800 MF, 60V, 100V SURGE	7 (4,3AB)	10	L109	36485	36220	L148	9000	4700 ±10% 2w	1500	3.0±5% 8W
LMEE-0-60	0-60	2.70	2.45	2.15	1.85	-60.0	+28.0	-60.5	63.0	880 MF, 100V, 150V SURGE	3000 MF, 100V, 135V SURGE	6.25 (4,3AB)	10	L108	36606	35902	L108	13,000	4500 ±3% 3w	4000	3.0±5%, 8W

* Fuse ratings in parenthesis apply to units with "V" option.



NOTES

1. RESISTOR VALUES ARE IN OHMS.
2. RESISTOR WATTAGE 1/2 WATT; RESISTORS ABOVE 2 WATTS ARE WIREWOUND UNLESS OTHERWISE NOTED.
3. RESISTOR TOLERANCES: COMP. ±10%; WIREWOUND ±5%; FILM ±5%; UNLESS OTHERWISE NOTED.
4. CAPACITOR TOLERANCES: ELECTROLYTIC -10%, +100%; MYLAR ±10%; UNLESS OTHERWISE NOTED.
5. SYMBOLS:
   - ↓ INDICATES CLOCKWISE ROTATION OF SHAFT.
   - ⊘ INDICATES ADJUSTMENT OR CALIBRATION CONTROL.
   - ⏚ INDICATES CONNECTION TO CHASSIS.
   - ▭ INDICATES ACTUAL UNIT MARKING
   - ✳ SEE INSTRUCTION MANUAL.
   - ⊣▶ LAMBDA PT. #FBL-00-030; USE IN4002 DIODE FOR REPLACEMENT UNLESS OTHERWISE NOTED.
   - ⊸ INDICATES TERMINAL ON PRINTED WIRING BOARD 'B'.
6. DESIGNATIONS ARE LAMBDA PART NUMBERS.
7. DELETE 40°C RATING FOR 45-55Hz, FOR 360-440 Hz, CONSULT FACTORY.
8. CONDITIONS FOR CIRCUIT POINT MEASUREMENTS: INPUT: 115VAC, 60 Hz , OUTPUT: 7 VDC, NO LOAD INDICATED VOLTAGES ARE TYPICAL VALUES AND ARE DC UNLESS OTHERWISE NOTED. DC MEASUREMENTS TAKEN WITH 20,000 OHMS/V VOLTMETER BETWEEN +S (TERM. 5) & INDICATED POINTS UNLESS NOTED.
9. COAT BOTH SIDES OF INSULATING WAFER WITH DOW CORNING NO. 340 SILICONE GREASE.
10. IF Q5 IS REPLACED, ALWAYS RETAIN RADIATOR AND INSTALL WITH NEW TRANSISTOR.
11. ON UNITS WITH "V" OPTION, TI HAS TAPPED PRIMARY. "V" OPTION UNITS CAN BE WIRED FOR 187-242V INPUT (USING TAP) OR FOR 205-265 V INPUT (USING ENTIRE PRIMARY). ON SERIAL NO. PREFIX A, "V" OPTION UNITS; TI PRIMARY IS NOT TAPPED. AC INPUT IS 205-265V.
12. ON UNITS WITH "V" OPTION C1 IS 0.01MF±10%, 1000V PAPER, F1 IS 4A, 3AB.

REFERENCE DESIGNATIONS NOT USED	
Q4	R15, R18
Q7, Q14	R21, R24
CR3, 4, 5	R19
CR10	
CR11	
R2, R11	
R12, R14	

RATING TABLE	
AMB. TEMP.	MAX. LOAD
40°C	16.0 A
50°C	13.5 A
60°C	11.2 A
71°C	9.2 A

(SEE NOTE 7)

FOR WIRING OF POWER SUPPLY TO LOAD REFER TO SUPPLY-TO-LOAD WIRING DIAGRAMS.

DOTTED CONNECTIONS SHOWN ON TB1 INDICATE JUMPERS IN PLACE FOR LOCAL SENSING CONNECTION.

THIS SCHEMATIC APPLIES TO UNITS BEARING SERIAL NO. PREFIXES A & B

SCHEMATIC DIAGRAM
REGULATED POWER SUPPLY

MODEL LMEE-0-7 0-7VDC

LAMBDA ELECTRONICS CORP.
MELVILLE NEW YORK

5-Year
Guarantee
We warrant each instrument manufactured by us, and sold by us or our authorized agents, to be free from defects in material and workmanship, and that it will perform within applicable specifications for a period of five years after original shipment. Our obligation under this guarantee is limited to repairing or replacing any instrument or part thereof, (except tubes and fuses) which shall, within five years after delivery to the original purchaser, be returned to us with transportation charges prepaid, prove after our examination to be thus defective.
We reserve the right to discontinue instruments without notice, and to make modifications in design at any time without incurring any obligation to make such modifications to instruments previously sold.

LAMBDA ELECTRONICS CORP.
515 BROAD HOLLOW ROAD • MELVILLE, L. I., NEW YORK • 516 MYRTLE 4-4200

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